FINANCIALTIMES

success at Unilever, Page 17

Cadbury

of Dr

\$17.5m

buys 30%

Pepper for

Sweet smell of

No. 30,015

EUROPE'S BUSINESS NEWSPAPER Tuesday August 26 1986

D 8523 B

US denies People attempt to provoke grounds Libya

.World news

been planned for many months.

Although Libya denounced the manoeuvres as a terrorist plot and Moscow criticised them as being SOUTH AFRICA: Capital outflow "openly provocative," the Pentagon said the US never had Libya in mind when mounting the exercise. Planning had started before the tension that culminated in the US bombing raid on Libya in April.

The Pentagon described the ma nocuvres as routine and said no US or Egyptian aircraft or ships would enter the disputed Gulf of Sirte or cross the "line of death" designated by Colonel Muammer Gadaffi, the Libyan leader. Page 2

Bhutto faces charges

The Pakistan Government is expected to decide next week what charges to bring against Miss Benazir Bhutto and other opposition leaders who were jailed two weeks ago when violent demonstrations swept through the country protesting against the rule of President Ziaul-Haq. Page 3

Tamil talks threat

Renewed separatist violence at the weekend in which 10 people were killed has threatened peace talks between the Sri Lankan Government and moderate Tamils.

Sikhs arrested

Indian police arrested two Sikhs suspected of assassinating General Arun Vaidya who commanded the army when the Golden Temple in Amritsar was stormed in 1984.

Fire penalties sought

French politicians sought stiffer penalties for arson after weekend fires swept through big tracts of scrub forest in the south-east, causing five deaths and leaving a trail of burnt houses and charred bush.

Soweto student riot

South African police fired with shotguns at students in Soweto af-ter a patrol car was pelted with stones. One person was killed and

Unemployment rises

The number of jobless in the 12-nation European Community rose by 175,000 in July compared with June, largely because of school leavers, the community's statistics office

Shcharansky reunion

Former Soviet dissident Anatoly Shcharansky arrived in Vienna from Israel for a reunion with his Ti-year-old mother, brother and other family members who left the Soviet Union to join him in Israel.

Bridge building

Denmark and Sweden opened talks on building a bridge or tunnel link between the two countries.

Food aid

The United Nations Food and Agriculture Organisation has approved food aid worth nearly \$26.2m for refugees in Pakistan and Central America and victims of strife and poor harvests in Lebanon.

Ugandan budget

In its first budget aimed at stimulating domestic production, Ugan-da's National Resistance Movement government discarded free market policies advocated by ex-President Milton Obote for a more managed approach to the economy. Page 2

Out of service

A gang which forged Iranian military service termination cards and sold them for up to \$75,000 each has been broken up.

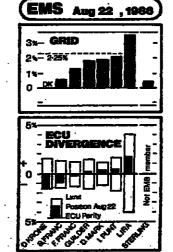
Express Frontier

Business summary

The Reagan Administration insisted joint US-Egyptian military manoeuvres that began in the Mediterranean on Sunday were not intended to provoke Libya and had been planned for many months. did not agree to a new wages deal

> amounted to R2.64bn (\$1.02bn) in the first half, the country's Reserve Bank said. Page 14 Johannesburg shares rose to another record on steady support for gold and industrial issues. Page 30

> EUROPEAN Monetary System: Sharp falls by the Danish krone and French franc - and the D-Mark's continued improvement -gave rise to renewed speculation of a realignment within the EMS last week. The Bundesbank was under mounting pressure to cut its dis-count rate to help the weaker currencies. The krone was at the bot tom of the system, close to its diver gence limit in Ecu terms and its cross rate limit against the D-Mark. Currencies, Page 19



The chart shows the two constraints on European Monetary System ex-change rates. The upper grid, based on the weakest currency in the system, defines the cross tales from which no currency (except the lira) may move more than 2% per cent The lower chart gives each currency's divergence from its "central rate" against the European Currency Unit (ECU), itself a basket of Eu-

TOKYO share prices surged on widespread bargain bunting, pushing the Nikkei index up 432.78 points, to 18,565.61, a record one-day gain which wiped out more than half the losses of the last three sessions. Page 30

WALL STREET: At 3pm, the Dow Jones industrial average was 10.97 lower at 1,876.83. Page 30

LONDON stock markets were closed for a holiday.

DOLLAR closed in New York at DM 2.0415 (DM 2.0410), SFr 1.8435 (SFr 1.6445), FFr 6.69 (FFr 6.6875) and Y153.70 (Y153.15). The London market was closed. Page 19.

STERLING closed in New York at \$1.4805 (\$1.4975). The London market was closed. Page 19

GOLD: The London market was closed. In Zurich the price was fixed at \$380.50 and in Paris it ended at \$386.50. In New York the December Comex settlement was \$386.50 against \$390.60 on Friday.

BANK OF ENGLAND is planning an experimental auction of govern-ment securities, similar to the US Treasury's bond auction. Page 14; details Page 16

ALBERT WOJNILOWER is to step aside as chief economist at First Boston, the US securities firm, although he will continue as a managing director and senior adviser. Men and Matters, Page 12

FRUEHAUF, US automotive parts and truck company, agreed to a sweetened \$1.12bn leveraged buy-out bid led by Merrill Lynch, Wall Street securities firm, and Frue-hauf's senior managers. Page 16

UNILEVER, Anglo-Dutch food and detergents group, has raised its stake in Naarden, Dutch flavours and fragrances group, from 40 per cent to 49 per cent. Background,

CONTENTS

Cameroon President says volcanic gas killed 1,200

AT LEAST 1,200 people are feared to have been killed by toxic gas seeping from a remote volcanic lake in north-west Cameroon, the country's President Paul Biya said yes-

terday.

Mr Georges Ngango, Information

Minister, said earlier that military reports from the scene estimated a death toll of at least 2,000. Mr Ngango said that between 200

and 300 people suffering from the effects of the gas fumes were being treated in hospital and that army teams were searching the 4 sq mile disaster area for more victims.

Soviets admit

design flaws

at Chernobyl

BY DAVID FISHLOCK IN VIENNA

MAJOR FLAWS in the design must

share the blame with human error for the nuclear reactor catastrophe

at Chernobyl, it was disclosed here

yesterday at the international "post

ortem" on last April's accident.

Academician Valery Legasov, a eading Soviet nuclear scientist,

neading a large Soviet delegation to

the meeting being hosted by the In-ternational Atomic Energy Agency (IAEA), spoke of a "tremendous psychological mistake on the part

Dr Ivan Emelyanov, chief design-er of the RBMK reactor, was dis-

nissed last month. Mr Legasov said the designers of

the 1,000 MW reactor had failed to

foresee the combination of mis-

takes and deliberate violation of

safety regulations which caused the

He said the erring operators were

completing tests on new equipment

in a hurry because, if they were de-

layed, they would have to wait at

least another year.

The possibility of an accident should have been foreseen and

would have been easy to prevent technically, he said. This is a great

fault on our part," he told nuclear

experts in a five-hour account of the

constructive discussion," of Soviet

reactor power, from near-zero to 50

BY KEVIN DONE IN STOCKHOLM

In July, the Italian company

worth at least SKr 3bn (\$441m).

The deal was subject to the ap-

proval of the workforce, the Fer-

cause of trade union opposition to

technology group, yesterday reject-ed the planned takeover of the com-

sion which blew off its roof.

accident and its aftermath.

eactor to explode.

of the designers of this reactor.

occurred on Friday, have been evacuated by helicopter, but most are reported to be still in the affected ea, around Lake Nios about 250 miles north-west of Yaounde, the

hampered by a lack of breathing apparatus and охудел.

team arrived in the country vester-

The Soviet Union will lose 10 per

cent of all electric power pro-

duced by its RBMK-type reac-

tors next year while it makes

the wake of the Chernobyl accident, Patrick Blum in Vienna

writes. Mr Valery Legasov, lead-

ing the Soviet delegation to a

special meeting of the Interna-tional Atomic Energy Agency, said the design alterations would

be costly. "Whether (they are) economic or not is a question

that will be resolved in practice,"

He redressed an imbalance in

which Moscow previously had heaped most of the blame on opera-

tors who, he said, were no longer

While he gave no indication that

Moscow was ready to shut down its RBMK reactors, he made it clear

that they were giving priority in new construction to their 1,000 MW

pressurised water reactor (PWR) and to newer designs

In the case of one of the errors -

operating the reactor with as few as

five control rods in place - he said:

"No one in the whole world, includ-

Mr Legasov admitted several cru-

Lord Marshall, chairman of the

Nuclear test ban, Page 3

from the Italian concern. In Milan

"surprised at the view of the Fer-

Montedison delegation had reas-

ing the Prime Minister of the country, was allowed to operate this o Vienna prepared for "critical and"

plans for improving reactor safety. cial design weaknesses in the It has over 15,000 MW of this type of RBMK. They included its inherent

reactor in service.

Mr Legasov illustrated his account of the accident with a colour to the acc

video showing glimpses of the red-hot reactor core before it was re-sealed, and a graph which starkly presented the final huge surge in very hot.

per cent, before the steam explo-sion which blew off its roof.

UK Central Electricity Generating Board, interviewed later, said Mr

His account, although basically Legasov's list of design weaknesses the version recorded in the official tallied very closely with one pro-Soviet accident report delivered to duced in Britain shortly after the

the IAEA 12 days ago, was drama- accident to demonstrate the basic

tised by the Soviet scientist's own weaknesses of this design.

Fermenta's unions

reject Montedison

LOCAL TRADE unions in Fermen- the Montedison takeover. The

ta, the Swedish chemicals and bio-workforce has two representatives

ed the planned takeover of the com-pany by Montedison, the Italian chemicals and health care group, union approval. However, it became

chemicals and health care group, union approval. However, it became plunging the future ownership of the company into fresh uncertainty.

Trading in Fermenta shares was suspended until further notice by to the deal because Fermenta had the Stockholm stock exchange its own unique development potential and a bright industrial future.

pending clarification of the Monte-dison deal. they wanted him to remain in the

agreed in principle with Mr Refaat dison had turned down a union sug-El-Sayed, the Egyptian-born Fergestion that it should initially

his controlling stake of some 78 per Mr El-Sayed had informed cent of the votes and 44 per cent of Montedison of the unions' rejection

the equity. The takeover would be and was waiting for a response

menta board and the Swedish Gov- menta trade unions." It said the

The Fermenta board, which met two weeks ago to consider the deal, no jobs would be threatened by a

menta group chief executive, to buy acquire only a minority stake.
his controlling stake of some 78 per Mr El-Sayed had inform

anges to make them safer in

zerland have also pledged assis-

The Foreign Office in London said last night that Britain would give "speedy and sympathetic" con-sideration to any request for aid, al-though no official appeal had been

Mr Shimon Peres, the Israeli President Biya, who visited the Prime Minister who arrived on an area on Sunday, has declared it a official four-day visit to the West Afdisaster zone and appealed for in-rican country yesterday, took a 20disaster zone and appealed for in-ternational aid. A French medical member army medical team equipped with oxygen and brea-

'dump' levy

on copiers

THE European Commission yester

day amounced anti-dumping duties of up to 15.8 per cent on plain paper

Ricoh, Toshiba and Minolta.

The duties, which are provisiona

and come into effect tomorrow for

at least four months, compare with alleged "dumping margins" (the dif-ference between domestic and ex-

port prices) of between 7 and 69 per

Japanese

to pay

. Some survivors of the leak, which day and Britain, the US and Swit- thing apparatus to help with rescue

The Government said that the gas which caused the disaster was hydrogen sulphide. It smells like rotten eggs and can paralyse respiration if breathed in sufficient concentrations. The gas, which is often found in volcanic areas, inhibits the functioning of the central nervous

French and US scientists said. however, that the gas could have been either carbon monoxide or carbon dioxide, thought to have

been the cause of a similar inciden in the same mountain chain in 1984, in which 36 people died.

The leak is believed to have been caused by an eruption or an under-ground landslide on the bed of the lake which lies in a volcanic crater. Three villages are thought to have been affected and the 10,000

inhabitants of the nearest large town, Wum, were being evacuated The Government has established

a crisis centre at Bamenda, capital of the English-speaking north-west-

erative, they will then be able to

So far, these talks have been very

• The contingency funds due to be made available to Mexico in the

event of a further collapse in oil

prices or its failure to meet econom-

• The treatment of a \$950m princi-

ency money, not included in the ba-

sic \$6bn fresh loan figure.

dwindling oil revenues.

jumps to \$2.5bn in 1988.

package of close to \$10bn.

Altogether, bankers say

plete. Among these are:

ic growth targets.

By Terry Povey in London CADBURY SCHWEPPES, the UK confectionary and soft drinks group, has expanded its US interests by buying a 30 per cent stake in the Dr Pepper Company, makers of the secret formula drink which has 7 per cent of the US soft drink mar-

ket in June, Cadbury-Schweppes spent \$230m buying the Canada Dry and Sunkist soft drinks businesses.
Cadbury Schweppes said yesterday that the group had concluded a S17.5m deal with financial institutions and the Dr Pepper manage-ment to take the stake as part of a leveraged buyout. "Our business is being geared very strongly towards

ing of Shearson Lehman Brothers, part of the New York investment bank, together with Hicks and Hallas, a Dallas investment company, and members of the management of Dr Pepper, announced that they had purchased the company from Forstmann Little for \$416m. Earlier this month, Coca-Cola was forced to drop a \$470m takeover plan for Dr Pepper after anti-trust objections.

Cadbury Schweppes said the in-vestment in Dr Pepper was stratechase control.

Mr Thomas Hicks of Hicks and Hallas confirmed this, adding that "there is no agreement for Cadbury Schweppes to increase its holding and no plans exist to go public." Cadbury Schweppes is to have two seats on a planned nine-member Dr

pal repayment still outstanding from last year and, like the conting-Dr Pepper will have four shareholders under the new scheme • The need in addition to refinance The need in addition to refinance bankers' acceptance loans raised by Pemex, the state oil monopoly, totalling \$3bn and £250m. Refinancing these operations could prove extremely difficult as they are specifically backed by Mexico's dwindling oil revenues.

Mr Hicks, his company together with the management, Cadbury with the management, Cadbury will each hold about 30 per cent of the reduced equity totalling \$58m. Forstmann Little is to retain a 5 per

 The probable need to refinance Most of last week's discussions loans falling due under Mexico's Fiamong the consortium's members corca scheme for rescheduling private sector debt. Though only \$50m centred on the debt financing arof these loans fall due this year, the rangements for the buyout. To com-Shearson Lehman leut Dr Pepper \$118m which will soon be recovered through an issue on non-convertible

> In 1985, 19 per cent of Cadhury gion turned in a £5.6m trading loss for the group. Following the loss, a Continued on Page 14

Venezuelan debt, Page 2

MEXICO hopes to start drawing many executives are away on holithis week on the \$1.6bn bridging loan agreed by leading industrial countries and banks to bolster its Japanese photocopiers, after one of the biggest investigations of its kind launched from Brussels. All reserves while it negotiates longer term assistance in servicing its the major Japanese manufacturers will be affected, including Canon, \$98bn foreign debt.

The drawings will come from the \$1.1bm to be provided by the US Treasury as well as the central five Latin American nations.

some Soon in fresh, medium-term credits to the Government of Presi-

cent, although most were found to be in the 20-45 per cent range. The move, which is likely to be fiercely contested by the companies, is a further sign of the Com-Nonetheless, the fact that more mission's determination to pursue what it sees as unfair Japanese pri cing practices. In the past couple of years, anti-dumping duties have been imposed on Japanese electron-

ic typewriters, excavators, roller bearings and outboard motors. Talks last week in New York be-The action is also bound to raise fears that the Japanese companies will circumvent the problem by stepping up their European assem

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bly operations. The Commission, however, is understood to be looking at ways of applying the duties to | rate shareholders, each of whom imported components as well as the has to be consulted at a time when finished products.

Japanese manufacturers' share of the Community photocopier market began to grow in the mid-1970s with a sixfold increase in exports to 272,000 units (or 80 per cent) re-corded between 1975 and 1981. This grew to about 600,000 units last year, which according to the Com-mission represents 85 per cent of machines sold in EEC member The other 15 per cent is dominat-

ed by Rank Xerox, which together with four other Community producers brought the anti-dumping complaint through the Committee of European Copier Manufacturers. One of these - Develop of West Germany - was subsequently taken over by the Japanese company Min-olta and withdrew its complaint. According to the Commission, its nvestigation, which covered the pe-

riod January to July last year, showed that Japanese manufacturers were placing machines on the Community market "at substantiallv below their normal value in Japan, causing serious damage to nanufacturers within the Community."

The case was complicated by the

fact that three of the Community manufacturers (Rank Xerox, Oce and Olivetti) were themselves importers of certain Japanese machines. In the case of Oce and Olivetti, the purchases were considere insignificant in volume terms and. for the moment at least. Rank Xerox - despite its Japanese associate Fuji Xerox - is to be considered in assessing the impact of the Continued on Page 14 dumped imports."

Mexico plans to draw on \$1.6bn bridging loan

Bankers who attended week's talks said yesterday the last hurdles should soon have been cleared. With the bridging loan op-

concentrate on the main rescue banks of industrial countries and preliminary, but they have already thrown up a number of complicat ing factors which are likely to make the deal especially hard to com-Commercial banks which are to

lend \$500m have made their portion of the loan conditional on progress first being achieved in syndicating dent Miguel de la Madrid.

than \$1bn should become available to Mexico this week will help to secure a continued flow of interest payments to bank creditors while the rest of the package is negotiat-

tween Mr Angel Gurria, the senior Mexican Finance Ministry official sponsible for debt negotiation, and leading creditor banks, were mainly designed to pave the way for the start of drawings on the

idging loan.
Though the banks do not at presat have to make cash available, ne formal consent to the bridging peration of about 50 leading crediore than \$480m outstanding to exico, was necessary before the edit from other sources could be This has proved a time consum-

g process since it has been necesy for each bank to obtain top levapproval for the deal. Particularuplicated is the situation facing London-based consortium banks with a wide range of sepa-London-based consortium

They said Mexico had so far made no mention of interest rate concessions to further bolster its finances, but a package of this size with interest concessions on top would be exceptionally hard to as-

means they are looking at a total subordinated loan stock. A further loan of \$240m was made to the investing group by Bankers Trust. Schweppes £1.9bn (\$2.8bn) sales were in North America but the re-

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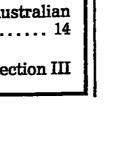
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OVERSEAS NEWS

Pentagon denies attempting to provoke Libyans

THE REAGAN Administration yesterday insisted that joint US-Egyptian military manoeuvres attack against Egyptian ter-that began in the Mediterranean ritory to allow Egyptian F-16s on Sunday were not intended to provoke Libya, and had been planned for many months.

Although Libya has denounced the manoeuvres as a terrorist plot, and Moscow has criticised them as "openly provocative," a Pentagon official said the US had never had Libva in mind in mounting the exercise. Planning had started before the outbreak of tension that culmi-nated in the US bombing raid

on Libya in April, he said.

The Pentagon described the manoeuvres as "routine" and said no American or Egyptian aircraft or ships would enter the disputed Gulf of Sirte or cross the "line of death" designated by Col Muammer Gadaffi, the Libyan leader. The exercise, code-named Sea Wind, was intended to under-

score continuing security ties between the US and Egypt, following strains in the relation-ship last year after the US forced an Egyptian airliner carrying the Achille Lauro high-jackers to land in Sicily, US officials said.

American carrier-based F-14 to practice defence, the Penta-

gone off his rocker again" and was preparing fresh ter-rorist attacks against US targets in Europe. Other observers, however, pointed out that it was unlikely that Egypt would join in manoeuvres intended to provoke Col Gadaffi. Syria's President Hafez al-

Assad continued talks in Libya yesterday as a leading Damascus newspaper de-nounced joint US-Egyptian military exercises in the Mediterranean, reports Reuter. "America must understand that beating of the war drums will never intimidate Syria and the Arab liberation movement."
al-Hasth, mouthpiece of the ruling Baath Arab Socialist

Party, said. Assad's surprise departure on Sunday for talks with Col Gadaffi coincided with the start of the air and sea maneouvres, the first such joint exercise in 15 months.

John Deere shuts plants after union calls strikes

By William Hall in New York

JOHN DEERE, the world's biggest farm equipment manufacturer, which is expected to post its first annual loss in over 50 years, yesterday closed all but one of its US factories after its workforce began selective strikes at three key plants.

The United Auto Workers

(UAW), the biggest of Deere's unions, ordered its members to strike at three facilities at mid-night on Friday, and Deere said yesterday that it had been forced to close all of its union organised plants as a result. The three plants supply key equipment for other plants.

However the union described the move as a lock-out and ordered its workers to turn up for work yesterday. About 12,500 workers are directly affected by the dispute. Another 9,000 union members are currently laid off but have the right of recall.

Deere is continuing to operate a non-union plant at Horicon, Wisconsin, and said that its overseas operations are continuing to work normally. However, its US plants supply

KAMPALA BUDGET ABOLISHES DUAL EXCHANGE RATE

Uganda discards Obote's policies

IN ITS first budget the government of Mr Yoweri Museveni's Under this, the priority ex- ends meet with the rising cost (NRM) has discarded the free constitutional Resistance Movement (NRM) has discarded the free constitutional Resistance Movement (NRM) has discarded the free constitutional families and the constitution of the constitu (NRM) has discarded the free market policies advocated by Uganda's former President managed approach to the

Abolishing the dual exchange mise measure in May, the Government has acted to peg the shilling at the rate for priority imports of 1,400 shillings to one US dollar compared with the former market exchange rate of 5,000 shillings to the dollar compared with the former time.

Local shopkeepers automatic-narket exchange rate of 5,000

In Kampala one investor ally raise prices on Saturday hillings to the dollar.

described the new exchange afternoons and many people

The two-tier system was intro-rate as nightmarish, saying it appear baffled about the shillings to the dollar.

essential imports, foreign debt

The system rapidly hit the prices of many goods imported privately, contributing to inflation rate estimates at up to tion rate estimates at up to 200 per cent. The drastic re-valuation will be accompanied by the introduction of a new currency in several months'

diplomats repayments and exports channelled through public corporations such as the Coffee Marketon the black market fetched

> hard currency. It also remains to be seen whether the new rate will lower the cost of consumer goods.

duced in a mini-budget in May. will be very difficult to make budget's real implications and Under this, the priority executes meet with the rising cost complained of rising fuel whome rate applied only to of labour and fuel. Western prices. The petrol price rase financial year 1985/86 as abnor mally difficult because of the cost of relief to areas affected by war and an increased wage

> The budget deficit in the current year, to be financed by borrowing, would be 349.7bn shillings (\$249m), with expenditure at 1,127.5bn (\$805m)

(\$556m), he added.



banks opening rural branches are to be abolished from the start of 1987. Corporation tax on financial institutions has risen by 10 per cent and in-come tax on commercial activi-

Argentine ministers discuss economic package

to combat the unexpected growth of inflation in the Argentinian economy in July and August.

THE NOMINATION of Dr Jose in the rate of inflation and to Luis Machinea, the deputy adopt measures which are expected to include a relaxation president of Argeatina's central bank, has raised expectations over the launching of a package stuffs, a continuation of a clearly defined the monetary policy to be followed."

Collapsed. "We are now in better condition to combat in nomy Minister, told bankers and economists gathered for the inauguration of an Argenover the launching of a package stuffs, a continuation of a of economic measures shortly policy of regular minito combat the unexpected devaluations and further tightening

of his appointment. Dr Machinea said that the economic team "will now act with greater coherence having a result of current seasonal food shortages.

He acknowledged that the inflationary reaction was greater than predicted but dismissed claims that the dismissed claims that th its overseas operations with Economic ministers held of his appointment. Dr parts and if the dispute conlengthy discussions over the Machinea said that the tinues for long, then it is likely weekend to analyse the prineconomic team "will now act to cause further disruption cipal causes of the acceleration with greater coherence having

and economists gathered for the inauguration of an Argentinian banking conference yesterday that the rise in the inflation rate was a result of current seasonal food shortages.

financial system also needed "cleaning up" through the "institutionalisation of trans-actions," a reference to the

black market in foreign exchange and credit dealings that have mushroomed over the past year due to tight restrictions on credit creation by the official banking system. Many of the black market operators stand to lose heavily and balance of payments are now under control. This gives us room for manoeuvre to stabilise prices," he said. He added that Argentina's

on unsupported futures deals in US dollars which have to be closed on Friday. The 30 per cent drop in the value of the Austral against the US dollar this month has left many

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*1985 Institutional Investor survey

Venezuela to pay \$750m of foreign debt this year BY JOSEPH MANN IN CARACAS

Venezuela's Ministry of Finance said this weekend that the Government planned to pay foreign banks a \$750m (£500m) principal payment before the end of this year.

Mr Jorge Marcano, Finance Director at the Ministry, also said be did not want to com-ment on whether the Government would ask foreign banks to loan it \$600m so that the \$750m principal payment could be made as planned. He added

be made as planned. He added that it was not appropriate to mix together comments about an agreed-upon loan payment and a possible future loan.

Mr Marcano's comments referred to a sticky problem that developed after the Venezuelan Government and foreign banks signed a loan restructuring agreement on February 22. The agreement, covering about \$20.9bn in public sector debts to around 490 foreign banks and financial institutions, called for Venezuela to make a \$750m.

A HIGH-LEVEL official at principal payment at the time Venezuela's Ministry of Finance the restructuring officially said this weekend that the becomes operational scheduled for the end of 1988. After oil prices fell earlier this year, the Government had second thoughts about making the \$750m "down payment," thus jeopardising the restructuring accord.

Now, however, it appears the administration of President comply with the lump-sum pay-ment. It is still not clear, though whether the Government will ask banks for assistance in making this payment.

ance in making this payment. Referring to some \$6.9bn in private sector foreign debt that has recently caused concern among international bankers, Mr Marcano also said the Government may develop a plan for allowing repayment of these business, obligations, over a pariod of \$1.7 years. He added pariod of 8-12 years. He added, however, that a final decision on this matter must be made by for Venezuela to make a \$750m. the Venezuelan Cabinet.

S. Africa and Mozambique clash over Nkomati Accord

BY ANTHONY ROBINSON IN JOHANNESBURG

CHARGES AND counter to either confirm or deny what charges are flowing again between South Africa and Mozambique over alleged infringements of key sections of the March 1984 Nkomati Accord under which Mozambique undertack to present the African area assistance over the past correspondents that US mili-tary assistance over the past under which Mozambique undertook to prevent the African
National Congress (ANC)
operating from the country and
South Africa agreed to cease
support for Mozambican
National Resistance (MNR)
rebels.

rebels.

South African security forces believe ANC guerrillas involved in planting landmines in the Eastern Transval have been moving through Swaziland from Mozambique while Mozambican sources allege that the MNR has received additional military supplies for their campaign to interrupt the road, rail and oll pipeline links between Zimbabwe and the port of Beira.

Mozambican allegations that supplies have been airlifted to MNR rebels from South Africa meet the standard refusal of the South African authorities

forces.

A 28-year-old black man was killed and eight injured yesterday when police fired birdshot at a crowd of 500 people who were stoning their vehicle, AP reports from Jehannesburg.

The clash occurred outside a high school in Johannesburg's main black township, according to the Bureau for Information, which said those injured ranged in age from 14 to 25. Earlier, the Bureau said a five-year-old black girl asleep in the home of a town councillor was killed by a hand grenade thrown through the window of her room.

four months had helped to shift the balance of forces in Unita's favour in the long civil war with Cuban and Soviet-backed Angolan government Fapla

All-out attack on Iraq urged

Iran's Parliamentary. Speaker Ali Akbar Hashemi Rafsanjani has called for an all-out attation Iraq to prevent Iran's Gulf war enemy from reorganising its forces, the Iranian news agency IRNA reported at the weekend.

Reuter reports that Mr Rafsanjani told a Tehran seminar that Iraq should be given no chance to reorganise

given no chance to reorganise its forces and that Iran, "by launching an all-out attack, should deprive the enemy from carrying out its mischiefs." He denounced what he termed imperialist plots "to force the Islamic revolution to kneel down."

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Wheat producers assail EEC, US export subsidies

Americans as one key cause of lower world prices for

agriculture.
In his opening address to the

CANADA came under intense presure to adopt the hardline views of Australia and Argentina against agricultural subsidies by the US and the European Community at a special meeting of the three leading wheat exporting nations in Cairns, north-east Australia, yesterday.

Hungary, muchanism in Uruguay are also attending the conference, which aims to ensure that agriculture gains top priority at next month's General Agreement on Tariffs leading wheat exporting nations in Cairns, north-east Australia, the Uruguay.

The conference was called by the Australian Government, balance CANADA came under intense Hungary, Indonesia, Malaysia, presure to adopt the hardline New Zealand, the Philippines

yesterday, Mr John Dawkins, the Australian Government, Australian Trade Minister, called on the EEC and the US to reduce and eventually remove production and export subsidies and forecast that the subsidies and forecast that the prices for leading agricultural products on world markets. crisis facing international grain exporters was likely to deepen in the next few months.

The three nations together produce around 44 per cent of world whast exporter with the

world wheat exports, with the US and European Community accounting for most of the

After their meeting yesterday the three nations agreed made a call for unity against that in the short-term produc-tion and release of surplus stocks to the export market by the US and EEC had to be made a can ror unity against the trading blocs of the US and the EEC, and warned that par-ticipants faced a long haul in changing the world trading restrained

restrained.

Mr Charles Mayer, the Canadian Minister placed the blame for the current wheat crisis firmly at the feet of the EEC.

The European Community denied yesterday that it had bettered an offer by the US to sell 4m tonnes of subsidised sell The US is at least talking about reducing production," he

Reuter writes from Brussels. said. Mr Dawkins said the three nations rejected market sharing, as proposed by the EEC, as a long-term solution to the problem. "The obligation The US announced this rests with those who have engaged in market subsidies and Moscow the wheat with a \$13 a Moscow the wheat with a \$13 a created the problem," Mr Dawkins said. tonne subsidy.

The three wheat exporters Mr Dawkins might have been held preliminary discussions referring to an EEC committee ahead of a 14-nation conference decision to make available for of agricultural trading nations export 850,000 tonnes of soft due to begin discussions today. wheat in store in the Com-Brazil, Chile, Colombia, Fiji, munity.

Test freeze gives US

advantages, says Moscow

NOTICE of the SECOND ANNUAL GENERAL MEETING of

Shareholders to take place on the 26th day of September, 1966 at 11 am.

NOTICE is hereby given pursuant to the Articles of Association of

The European Banking Traded Currency Fund Limited ("the Company") that the Second Annual General Meeting of the Company will take place on the 26th day of September, 1986 at 11 am at EBC House, 1-3 Seale Street, St. Heller, Jersey, Channel Islands for the purposes of considering and if thought fit, passing the

Resolutions That the Financial Statements for the period ended 31st March, 1986 together with the Report of the Directors and the Auditors thereon be received, approved and adopted.

2. That Messrs. Coopers & Lybrand who have signified their

willingness to continue in office be and are hereby appointed the Auditors of the Company for the ensuing year and that the fee

payable to them in respect of the year to 31st March, 1967 be determined by the Directors.

By order of the Board

EBC Trust Company (Jersey) Limited

following Ordinary Resolutions:

France speeds profit share legislation By David Housego in Paris

THE FRENCH Government is bringing forward legislation to widen employee participa-tion in both the management of industry and in the profits it makes.

Ministers met vesterday to finalise details of two decrees to be put before the Cabinet early next month which reflect long-held Gaullist ideas on encouraging worker ownership and profit-sharing

At the same time, in pushat the same time, in posi-ing forward the legislation now, the right-wing govern-ment of Mr Jacques Chirac, is anxious to show that it is no less progressive than the Socialists over labour issues.

The proposals have received a mixed welcome from trades unions—with the more left wing unions being reluctant to be drawn into co-responsibility for industrial management. trial management. Of the two decrees, the first will allow worker representa-

conference, Mr Bob Hawke, the Australian Prime Minister, tives to have up to a third of the seats on company boards. The measure will be voluntary and at the initiative of companies. It requires the approval of a two-thirds majority in the general assembly.

assembly.

The new law will replace and extend legislation brought in by the Socialists to "democratise" the public partonalisa-The denial was issued by EEC officials in response to a statement by Mr Dawkins that the EEC had countered Washington's offer with a better one. sector after the nationalisa-tions of 1982. This law, which required nationalised companies to have work representatives on their boards, will progressively expire as

companies are privatised.

The intention of the second decree to go before the Cabinet is to simplify and broaden existing schemes EEC grain trade sources said with the emphasis on encouraging long term savings

within a company.

The draft decree envisages companies must set aside from profits for a reserve fund

US considers short-term help for Bolivia

By Peter Montagnon, Euromarkets Correspondent,

THE chief of staff of the Soviet armed forces, Marshal Sergei Akhromeyev, said yesterday damage to ourselves, but we took into account that this torium had given the US some advantages but had not altered the East-West military balance, conference.

Renter reports from Moscow.

Mr Akhromeyev said the muclear tests since the Soviet Kremlin's civilian leadership moratorium took effect in cludant decided to extend the test yield tests in August 1985. THE US Treasury is considering short-term financial assistance to Bolivia which is facing an acute shortage of foreign exchange, exacerbated by its recent crackdown on the narcotics

had decided to extend the test yield tests in August 1985, freeze until January 1 because autumn 1985 and spring 1986, the political benefits out he said. The test freeze began weighed the costs to the Soviet on August 6 last year. week, is likely to be seen as further evidence that the so-called Baker Plan to ease the developing countries' debt crises is finalby being implemented. The plan was launched by the US at the International Monetary Fund meeting in Seoul last year. The European Banking **Traded Currency Fund Limited**

The Treasury's state which gave no figure for any likely loan, praised Bolivia for its efforts in reducing inflation which has been cut dramatically to 50 per cent in the first six months of this year from 8,600

per cent last year. Commercial bankers who have been working on Bolivia's \$3bn foreign debt said the Treasury move was an unprecedented one which suggested it could also be: designed as an incentive to Bo-livia for its action on the drugs

They said such short-term financial assistance was normally only granted to countries with much larger foreign debts, such as Mexico, in the immediate af-termath of an economic policy

agreement with the IMF. It was also unusual for the US to consider a bridging loan without determining clearly how its loan was going to be repaid, they

Five die in Cote d'Azur forest fires

FIRES THAT have ravaged the pine and mimosa-clad hills above the French Cote d'Azur over the past three days seemed to be losing momentum last night, reports

our Paris staff.
Five people were killed and
8,500 hectares of hillside
burnt in a second wave of
forest fires which has hit the South of France this year.

Local officials suspect that
some of the fires were
deliberately started. A young
West German tourist arrested yesterday on charges of starting a fire, admitted he had tried to start another the day before in the hope that cars would half and give him

Worst damaged were the hillsides between Grasse and Cannes where the flames destroyed 7,000 hectares of pine forest and scrub land, including wild miness. In including wild mimosa. In the wake of the worst drought the South of France has known for 30 wars the flames spread at lightning speed. Over 2,000 hectares around Luceram above Nice were

Islamabad ponders what to do with Bhutto

BY JOHN ELLIOTT IN KARACHI

THE PAKISTAN Government is expected next week to decide what charges to bring against Miss Benazir Bhutto and other leaders of the country's political opposition, who were jailed nearly two weeks ago, when violent demonstrations swept through the country protesting against the ruling regime of President Zia ul-Haq.

Caim has now been restored throughout the country and there have been no big demonstrations over the weekend, although a growing problem of armed attacks by bandits is continuing to disrupt the southern province of Sind, which was at the centre of the political pro tests and is now being patrolled by the army.

Tension has eased in the southern city of Karachi, the country's commercial centre and the capital of Sind, where there were major riots which there were major riots which caused concern among the business community.

In an interview yesterday, Mr Syed Chous Ali Shah, Sind's Sind's Seed Chous Ali Shah, Sind's Seed Chous Ali Shah, Sind's Sind's Saudi Arabia, where he had two-week Moslem pilgrim—
on a two-week Moslem pilgrim—
on sind.

Miss Bhutto's credibility as a sonserepared on a two-week Moslem pilgrim—
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President Zia ul-Hag

chief minister, denied reports that charges for the capital crime of sedition and treason had been filed against Miss Bhutto, whose father, President

reports" had been filed against various groups of people for charges including murder, which in Pakistan carries a penalty of hanging. But "her names does not appear because she was not on the spot." He added that she "could be linked if people who have been

named implicate her" and added: "If evidence comes against her, she will not be an exception—she will be treated same as everyone else. However, it seems unlikely that President Zia will want to upset the country's political stability by making her a martyr. Her present 30 days upset the country's political stability by making her a martyr. Her present 30 days of detention expires in two weeks' time.

President Zia returned to Estimates of those killed range from official figures of 20 to over 40 and more than 2,000 people are believed to have been arrested; Mr Shah

weeks time.
President Zia returned to Pakistan on Saturday from said only 85 were still being Saudi Arabia, where he had held in Sind. on a two-week Moslem pilgrim— The tough army action in

tions. day by Mr Mohammed Khan Mr Shah said that "a lot of Junejo, the Prime Minister. President Zia, who does not appear to have suffered politically as a result of the crisis, reviewer the political and security situation with senior officials. Mr Junejo, whose credibility has taken a knock. has started meeting members of Pakistan's parliament in

individual states in an attempt to build a political consensus for the action he ordered against the demonstrations, which built up into Pakistan's most serious outbreak of violence since an uprising in Sind in 1983.

tions, in effect squashed the attempts by Miss Bhutto's party to mount a big offensive against

the Government.

The party had intended to launch this offensive, possibly including some civil disobedi-ence and disruption of communications from September 20. But it decided to bring this forward to August 14 as a response to Mr Junejo's ban on indepen-

dence day meetings.

That played into the hands of the Government, which wanted to deflect the opposition away from the September 20 target. Political activists in the Puniab failed to support demonstra-tions in the Sind and this led to the campaign collapsing because no alternative organisation or system of communica-tion had been prepared to take over when the top leaders were

Indonesia and Philippines plan common market

INDONESIA and the Philippines agreed yesterday to work towards creating a Southeast Asian common market by the year 2000, Philipine Minister of Trade and Industry Jose Concepcion said, Reuter reports from Jakarta.

Concepcion said, Reuter reports
from Jakarta.

The idea was discussed at wide-ranging political and economic talks between economic ministers of the two countries agreed on a vision of

with Thailand, Singapore, Malaysia and Brunei, will hammer out the common market plan at an Asean summit meeting next July in move gradually toward a com-Manila, he said.

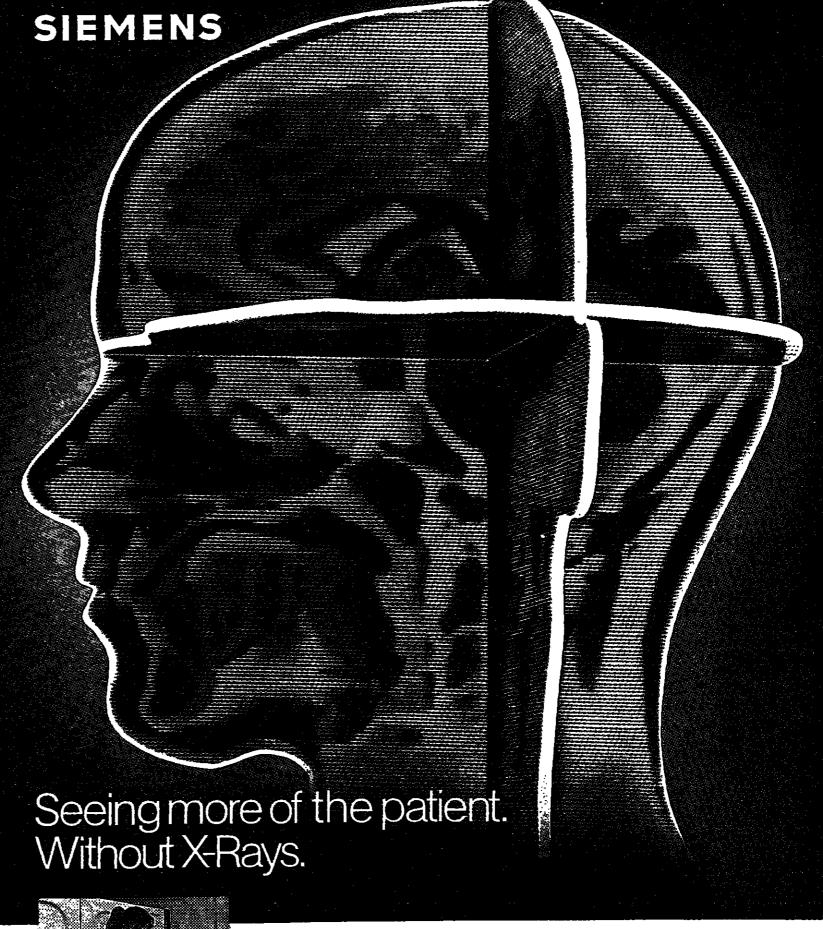
Manila, he said.

mon market over the next 14 free system is achieved

tomorrow.
Mr Concepcion said Indonesia

countries while Philippine President Corazon Aquino was holding separate talks with President Suharto.

The political discussions focused on the Kampuchean of the Rampuchean Mr Concepcion said Indonesia import tariffs would be gradu-suggested that Asean should ally taken off the preferential





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Dated the 18th day of August, 1986,

NOTES

1. The holder of a Continental Depositary Receipt ("CDR") may exarcise his voting rights by depositing the CDR at the office of Amsterdam Depositary Company N.V., 172 Spustraat, 1012 VT Amsterdam, The Negherlands (the "Depositary") and by Instructing the Depositary as to the exercise of the voting rights attached to the Shares evidenced by such CDR. In the absence

voing ngmis awas new as one consumer only such to the interests of such instructions, the Depositary will exercise such voing rights or retrain from doing so, as it thinks lift in the interests of the holder.

crédit foncier de france

¥ 15,000,000,000

Guaranteed Floating Rate Notes Due 1997 For the six months 27th August 1986 to 27th February 1987

In accordance with the provisions of the Notes, notice is hereby given that the rate of interest has been fixed at 4% per cent. per annum, and that the interest payable on the Interest Payment Date 27th February, 1987 against payable on the Interest Payment Date 27th February, 1987 against Dayable on the Interest Payment Date 27th February, 1987 against payable on the Interest Payment Date 27th February, 1987 against payable on the Interest Payment Date 27th February, 1987 against payable on the Interest Payment Date 27th February, 1987 against payable on the Interest Payment Date 27th February, 1987 against payable on the Interest Payment Date 27th February, 1987 against Payment Date 27th Payment Date 2 Coupon No. 3 will be: \$24,278 per \mathbf{\pm} 1,000,000 and \mathbf{\pm} 242,778 per \mathbf{\pm} 10,000,000.

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Christian Tyler reports on selling power stations to customers who cannot afford them

Tan admits guilt to Pan-Electric collapse charge

BY WONG SULONG IN KUALA LUMPUR

high court to an amended charge of abetment in criminal breach of trust related to the collapse of Pan-Electric Industries, the Singapore marine salvage, engineering and hotel group. He faces up to three years in prison and an unlimited fine when the

sentence is delivered today. Whatever the sentence however, Mr Tan's political status as president of the Malaysian Chinese Association, the Chinese partner in the Malaysian coalition government, and a member of parliament, would be unaffected as the Malaysian

constitution provides for dis-qualification only if the offence is committed within Malaysia. Mr Tan, 45, still faces 14 criminal charges related to abetment to criminal breach of trust, stock market manipulasentence is life imprisonment, markets. but the Singapore authorities In miti

MR TAN KOON SWAN, the have indicated they would not prominent Mayalsian business- go ahead with them if Mr Tan man and politician, yesterday makes adequate restitution to pleaded guilty in the Sinagpore Pan-Electric Industries and based the forward state. eases the forward share purchase contracts of the company. After Mr Tan had pleaded

guilty, the prosecution told the court that it had agreed to amend the charge on condition Mr Tan pay \$\$34m (£8.7m) to Pan-Electric, which is now under provisional liquidation, and take over the company's forward con-tract obligations.

The prosecution told the court Mr Tan had used a series of complicated share dealings to gain control of Pan-Electric, and create an artificial market demand to raise share prices of that company, Grand United Holdings (his master company) and its subsidiaries. Pan-Electric collansed last

tion and fraud, for which the Singapore and Malaysian stock Corporation and Everpeace -



Mr Tan: still face 14 possible charges

sked the court not to jail him but "to impose a fine of a very substantial amount consistent with the gravity of the offence." He said Mr Tan had reached a deal with five Singapore brokers on the forward contracts, and if called upon to pay after 18 months he could be exposed to the extent of \$\$53m.

A group of eight Malaysian businessmen and six banks are involved in a complex guarantee November owing US\$180m in agreement as part of the deal debts and the crisis forced a with the brokers, and Mr Tan's three-day suspension of the companies — GUH, Supreme

In mitigation, Mr Tan's lawyer be relisted soon to allow trading

Power engineers fight credit war for exports THERE IS a new kind of ness, NEI Parsons (formerly engineer in the power plant C. A. Parsons) on Tyneside, had industry these days. He wears a feast of home orders during

can hope to export to the walked in.
power-hungry developing By the m

where delivery times have halved in the past decade. If you want to export a power-station, the makers say, cheap and generous credit is essential.

"The people who need our kit can't afford to buy it," said Mr Graeme Anderson, deputy chairman of Northern Enginering Industries, the only British company that can build a com-plete conventional power conventional power station,

the basis of the excellence of our plant, or its reliability all the things a good engineer thinks of. Unless we are able to match the finance offered by our competitors, the customer will not buy from us, however super the equipment is."

NET's experience is typical. Forced abroad by lack of home orders, the company had first of all to cut its production costs and shorten its delivery schedules, before it could hope to enter the cut-throat credit

fray. Its turbine generator busi-

a pin-striped suit and spends the 1960s. With customers most of his time in banking queuing at the gate, traditional parlours dreaming up sophisticated loan packages. He is lia and Canada, were left called the financial engineer: unattended, and new competiwithout him, no plant-builder tors, especially the Japanese,

By the mid-1970s, things were looking bad, as home orders World-class design, computerised production and tireless salesmanship are no longer
enough in a buyers' market,
business was saved by government agreement to bring for-Drax power station in York-shire, and Reyrolle Parsons and Clarke Chapman were merged

A £70m programme of investment was launched in 1980. In the first five years, £40m were spent, mainly on reequipping the turbine generator has with computer-controlled. shop with computer-controlled lathes. About a quarter of the plant has now been renewed, each modern machine replacing four or five old ones.

Computer-aided design was introduced to help engineers refine the shape of turbine blades for maximum efficiency. to standardise component manufacture, and to piece together on television screens the complicated lay-outs of the modern power station. About 1,200 jobs have been

shed from NEI Parsons in the last six years; a big batch of 600 redundancies was declared in May, and there is every sign an order in Singapore — "their the process is not yet over. an order in Singapore — "their own backyard" — has supplied

by what Mr Richard Maudslay, the 39-year-old managing director of Parsons, calls "a ruthless re-examination of all the overhead costs." Mr Maudslay says: "Until the

late 1970s, we were suffering from what people used to call the British disease. But in the the top three in our bids for contracts.

The company's persistence was rewarded with four orders in new markets in recent years. It was chosen in a consortium with Klockner of West Germany to build the Jacui power station in Brazil, beat the Japanese to own backyard" - has supplied

power station in Iraq.

A turnkey contract for the

Rihand power station in India, won with the help of British government aid, has been a less happy experience. The work fell badly behind schedule, but is now said to be up to its revised target. The company hopes to land the contract for Rihand's extension.

Yet the export market is today only a quarter of what it was ten years ago, despite enormous pent-up demand for energy in the 'developing world India alone has a shortfall of 10,000 MW, equivalent to the total generating capacity likely to be installed in Britain between any and the and of the between now and the end of the

China, Mexico and Turkey, among others, all need power stations, but cannot afford to buy them off the shelf. As a result, plant builders are forced into temporary international alliances in order to tap the aid funds of various governments.

funds of various governments.

That is why, for example, NEI Parsons is bidding with Marnbeni, the Japanese trading house, in China, and with Canadian, Italian and Austrian companies in Turkey. About half of all the business today is undertaken by such consortiatine trick is to find the partner whose government will bring most political influence—and cheap credit or grant aid—into cheap credit or grant aid-into ne bidding. It is also why big British con-

three units to Botswana and is sub-contractor to Hyundai of South Korea for the Al Mussaib Government to sharpen its responses to international credit competition. Mr Anderson, the competition. Mr Angerson, the deputy chairman, was one of those who lobbied for the recently announced £300m soft loan facility for China. "It fook 12 months to get a

commitment on soft finance," he said. "The response time he said. "The response time really is a bit slow. Everyone knew it would be necessary and we need to know whether funds are going to be available before

we start.
"After all, it's very expensive to go to these places." In the event, one of the four big projects for which the soft loan is being earmarked is NET's tender with civil engineers Bal-four Beatty to build two 350 MW units at Yueyang in

Co-ordination can be as important as cash in this huyers market. For example, some Parsons people believe they lost the order for a fourth unit in Botswana because the Japanese threatened to pull out their other commands wentures in the country, unless a Japanese company got the order.

the UK had simultaneously been negotiating to provide free SAS training to the Bots-wans armed forces. The two approaches were never linked. Had they been, the result might have been different. Credible or not, that is the kind of calcu-

Korean succession strengthened

BY STEVEN B. BUTLER IN SECUL

A SWEEPING shake-up in the leadership of South Korea's ruling Democratic Justice Party (DJP), announced at the weekend, appears to have strengthened the position of Mr man, as beit-apparent to the

The shake-up, which was orchestrated by Mr Roh, reconfirmed his chairmanship of the party while bringing in a number of prominent number of prominent politicians and former military officers to fill senior positions.

Mr Chun Doo-Hwan, the President, is also president of the DJP, although he tends to stay aloof from party affairs. He has vowed repeatedly to step down from power in February 1988, when his term

of office expires. Mr Roh's strengthened grip Minister and a ceremonial high marks for his leadership on the party is especially im
President. Many now believe of the DJP, which he has tried portant since the DJP has that Mr Roh will emerge as the begun campaigning to intro-duce a cabinet system of Prime Minister.

A draft constitution presented A first constitution presents to parliament today by South Korea's ruling party would preclude dissident Mr Kim Dae-Jung from running for president in the next elections, Reuter reports from

Democratic Justice Party (DJP) officials said the proposed constitution stipu-lates the president must have lived in the country for five uninterrupted years. This would, in effect, bar Mr Kim, who only returned to South Kores in February last year after two years of self-imposed exile in the US.

Government in which the National Assembly will elect by simple majority a strong Prime

The shakeup was also designed to improve the party's public image as it negotiates with the Opposition over contion is campaigning for a direct popular vote for a strong President.

Mr Roh. 53, is a retired general who played a key role in the military coup that brought Mr Chun to power in

Mr Roh, who has never stood for election, has served as Sports Minister, Home Minister and president of the Seoul Olympic Organising Committee since shortly after the February 1985 elections, in which the Oppositon made a very strong

Mr Roh is none the less given to build into an independent political force out from under the wing of the President.

Iran 'to resume Soviet gas sales'

first time in more than six years, the national news agency Irna said yesterday, Reuter reports from Tehran.

EXPORTS LIKELY IN DECEMBER

been reached with Moscow, but predicted that exports would start at a rate of 3m cubic metres per day in December, and rise to 80m or 90m cubic metres per day by March 1990. It did not mention prices,

Mr Gholamreza Agazadeh, Iran's Oil Minister, discussed

IRAN EXPECTS to resume the resumption of gas exports and was unlikely to be able to natural gas exports to the when he visited Moscow last take its former daily average throughput of 28m cubic metres.

Exports were suspended in Islamic revolutionary govern-It did not say agreement had ment in Tehran for a substan-

by November on the condition of the IGAT-1 pipeline used to carry gas north from oilfields in southern Iran. Diplomats had said earlier this year that the Iranian coast at the mouth of 16-year-old pipeline was rusted

■ Iraqi attacks slashed Iran's early 1980 after Moscow had oil exports by more than 50 per rejected demands by the new cent last week to a dally average of some 600,000 barrels, the authoritative Middle East Irna said Soviet and Iranian yesterday, AP writes from experts would complete a report Nicosia. Iran has temporarily

World Economic Indicators

INDUSTRIAL PRODUCTION

		_		GAGE	previous
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	june '86 107.0	May '86 108.3	April '86 110.3	June '85 108.4	-13
W. Germany France Italy Netherlands	May '86 105.5 98.8 98.5 100.6	April *86 110.7 103.8 100.2 107.0	March *86 101.9 100.1 101.4 103.2	May '85 103.9 99.5 97.1 101.8	+15 -07 +14 -12
Japan	122.1	121.7 Sour	121.7 se (except U	124.3 S. Jepen): E	-1.8

Mahathir and Lee agree over gas and water By Wong Sulong in Kuala Lumpur

BREAKTHROUGH has A BREAKTHROUGH has been achieved in talks for the long-term supply of natural gas and water to Singapore by Malaysia, following a meeting here ever the weekend between Dr Mahathir Mehamad, the Malaysian Prime Minister, and his Singapore counterpart, Mr Lee Kuan Yew.

Lee Kuan Yew.

He said the two projects were agreed between him and Dr Mahathir in 1982, but officials from both sides had been bogged down by several unresolved issues. Final agreement on the two prejects could come within mouths if not weeks, he said. Singapore has proposed joint development of the Johere River for additional Johore River for additional water supply, and also wanted to buy natural gas from Malaysia's offshore Treng-

However, Malaysian offi-cials had felt Singapore did not need extra water, and it was entitled to take 340m gallons from Johore under current agreements, but uses current agreements, but uses only half that quota. Negotiations on natural gas supply have been bogged down over pricing, and the reluctance of Singapore officials to be too dependent on Malaysia.

SHIPPING REPORT **Markets** more

By Andrew Fisher,

cheerful

THE TONE in shipping markets was cheerful last week, with rates finally moving ahead on the dry cargo market and continuing to be firmer for

tankers.

Denholme Coates, the UK shipbroker said: "A marginally brighter light has dawned," for dry cargo vessels. The rate for grain from the Gulf of Mexico to Japan was firmer at \$8.95 a ton for early shipments and around \$9.30 for October,

November and December. However, these rates are still below the lowest levels of 1986. The rate from the Guli of Mexico to continental Europe also crept up last week to around \$5 a ton and then exceeded \$6 on Friday.

In both the tanker market, which has recently benefited from lower oil prices, and the dry cargo sector, there is still considerable uncertainty. Production curbs imposed by

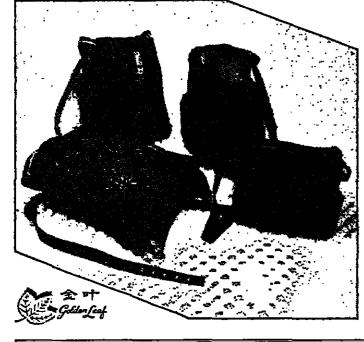
the Organisation of Petroleu Exporting Countries (Opec) could again limit tanker activity, though Galbraith's, the London shipbroking firm, said shipowners generally remained optimistic about prospects for large vessels.

July_1986

A. Angle

Market 1 -

"GOLDEN LEAF" Canvas Bags



"Golden Leaf" Brand canvas bags from Anhui, China, are made of top quality 100% cotton canvas. Of exquisite colours, they are available in all sizes and in a wide variety, including school bags (single and double belt type), hand bags, rucksacks and bags for mountaineers.

The inside is coated with plastics. Our bags are thus waterproof, strong and durable.

China National Light Industrial Products I/E Corp., Auhui Branch Imp. & Exp. Building, Jinzhai Rd., Tel: 61835 Telex: 90016 AHIND CN

Cable: "INDUSTRY" Hefei

Anhui Animal By-Products

Anhui Animal By-products Branch of China National Native Produce and Animai By-products I/E Corp. is the sole lawful sales agent specialising in the import and export of animal by-products in Anhui.

Anhui Province has rich supplies of quality animal byproducts. The province ranks among the biggest producers of feathers of unrivalled quality, specially known for their thick

Anhui is also a major producer of rabbit hair, which is soft, pure white and of standard length.

Anhui raw goatskins are noted for its fine grains, softness and tenacity. Our bristles are resilient and of appropriate toughness. Our animal feedstuffs are all of excellent quality.

We mainly handle the following products: rabbit hair, rabbit hair yarn, feathers, down, various feather and down products. raw goatskins, leather garments, fur and fur products, casings, bristles, bristle brushes, manc, goat's hair and animal

Besides I/E trade, we are also active in supplied material processing, compensation trade, joint production and joint ven-





China National Native Produce & Animal By-Products I/E Corp., Anhui Animal By-Products Branch I/E Building, Jinzhai Road, Hefei, China Telex: 90012 AHXC CN Cable: ANHUIXC Tel: 61685,61269

These securities soere offered and sold outside the United States of America. This announcement appears only as a matter of record.

U.S. \$75,000,000

NEW ISSUE

Burlington Industries, Inc.

7% Convertible Subordinated Debentures Due 2001

Kidder, Peabody International

Algemene Bank Nederland N.V. Goldman Sachs International Corp.

Julius Baer International

Lloyds Merchant Bank

SGS Finance S.A.

County NatWest Capital Markets Merrill Lynch Capital Markets

Morgan Guaranty Ltd Swiss Bank Corporation International Limited

Salomon Brothers International Union Bank of Switzerland (Securities)

Carolina Bank

S. G. Warburg Securities

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Banque Scandinave en Suisse

Vereins- und Westhank

Toronto Dominion International

Sumitomo Finance International

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UNFI	TED STATES			JAPAN		WES	T GERMANY			UK	
	Janua	ry-June		Tames		*****		y-June			anugry-June
Demestic	1985 %	1986 %		1985 %	uy-Jung		1985 %	1986 %		1985 %	1986 %
Innorte """	4,314,667 76.61	4,139,979 73,30	D-markle		1980 %	Domestie	874,692 69,60	994,216 7.30	Demostic	389,539 41.3	
Total market	1,316,960 23,39	1,508,245 26.70	Domestic	1,547,227 98.46 24,224 1,54	1,588,970 98.00	Imports	383,005 30.40	482,786 92.70	Domestic	554.097 58.	
DOM:	5,631,627 100.00	5,648,224 100.00	Imports	1,571,451 100.00	32,240 3.00	Tetal market	1,256,697 100,90	1.477.902 100.90	Imports	943,636 100.0	00 964,706 100.00
DOMESTIC			Total market	The safage that the	1,619,210 100.00	101111		7,71 1,000 100.00	Total market	359'090 180"	102,700 100.00
General Motors	2,436,247 43,26	6 been been 40 oo				DOMESTIC			normania.		
	2,436,247 43.26	2,373,738 42.03	DOMESTIC				000 000 00 00		DOMESTIC		
	1,081,872 19.21	1,006,493 17.82		675,898 43,00	=14 =00 44 ==	Volkswagen	289,300 23.00	333,697 22.60	Ford	246,973 26.3	17 257,921 26.74
Houda	603,521 10.72	576,651 10.21	Toyota		714,361 44.12	Andl	73,580 5.90	79,621 5.40	Rover Group	179,262 18.0	
Volkswagen	83,051 1.47	92,430 1.64	Nissar		392,990 24.27	Total VW-Audi	362,880 28.90	413,318 28.00	General Motors:		, -
American Motors	39,962 9.71	39,091 0.70	Henda	139,796 8.89	153,959 9.51	General Meters-Opel	198,641 15.80	227,307 16.40	Vauxhall/Opel	163,154 17,3	2 9 154,635 16.0 3
Wafata	62,430 1.11	35,206 0.62	Mazda	95,474 6.07	98,275 6.07	Mercedes	140,625 11.20	154,511 10.50	Peugeot-Talbot	39,664 4.2	
LEADING IMPORTURE			Mitsubishi	88,284 5.60	76,365 4. 72	BMW	78,093 6.20	79,191 5.49	Citroen	13,519 1.4	
	000 000 5 04		Dathatsu	52,631 3.35	50,124 3.09				Total Peugeot group	53,183 5,0	
Nissan	283,932 5.04	277,780 4.92	Fuji (Suberu)	39,225 2.49	38,077 2.35	LEADING IMPORTS			7/Thek-le-	4,161 0.	44 3,884 0.49
Honda	251,293 4.46	238,321 4.22	Suzuki	38,187 2.43	32,484 2.01	Flat	56,071 4.50	68,099 4.60	Jaguar/Danmer		72 2,002 0.10
Volkswagen-Audi Mazda	202,84 9 3.60	201,060 3.56	Isom	26,35 0 1.2 9	30,335 1.87	Peugeot	28,013 2,20	43,857 3.00			
Mazda	105,115 1.87	109,884 1. 9 5		 ,		Citroen	20,591 1.60	25,656 1.70	LEADING IMPORTS		
Subarra	86,350 1.53	103,506 1.83	THE PARTY OF THE P			Talbot	2,303 0,20	372 0.00	Volkswagen-Audi	57,439 6.0	09
Mitsubishi	78,499 1,3 9	92,975 1.65	LEADING IMPORTERS			Total Peugeot group	50,988 4.00	69.885 4.70	Nissan	46,368 4.	
L'Alua	62,287 1.11		Velkswagen-Andi	8,988 0,57	11,092 0.68	Renault	43,103 2.40	48.306 3.30	Volvo	31,683 3.	36 35,513 3.65
Plane Ja	57,580 1.02	63,423 1,12	BMW	5,558 9.35	8,093 0.50	Manage 1	32,120 2,60	46.139 3.10	Dan	39,420 4.	
Hyundai	6 0.60	52,396 0.93	Daimler-Benz (Mercedes)	4,796 0.31	6,407 0.4 0					90, 240 % .	
	2 0.00	aniana Ama	named new (merteres)	20100 A9T	0.40 7 0.40	<u> </u>	36,239 2.90	44,422 3.00	Fiat	29,291 3.	10 31,390 3.25

Customers in the US re-discover the 'cheapie'

south Korean car maker, in the US this year is remarkable, even by the standards of the volatile American market.

US customers

US customers re-discovered cheap new cars and helped Hyundai take nearly 1 per cent of their market in the first six months. Thus the company is well on the way to its target of selling 100,000 cars in its first full year in the States.

All this interest enabled Hyundai to put together very quickly a formidable dealer network.

The Japanese were not left completely out in the cold by the emergence of the demand for really cheap new cars in the States. full year in the States.

By the end of June Byundai had sold more than 52,000 of the small, front-wheel-drive Excel models which in basic form have a list price of 4,995 compared with the average \$12,000 Americans pay for a new car or the average \$5,400 for a used

Hyundai's timing was fortui-tous. The Japanese car makers who once dominated the cheaper end have been moving up-market now they can no longer look for big volume growth in the US.

When Hyundai announced last year it would launch in last year it would launch in the US this year, one new car dealer in every 10 applied for Spectrums, up from 23,000 in the franchise.

Dealers had in mind the fortunes made by some colleagues who got in on the ground floor when the Japanese groups first started tacking the US car launched with a base price of market. They also knew about \$3,990 late last year by an Hyundai's phenomenal success independent importer from the in Canada where it was able to state-owned Zastava company in take advantage of the restric- Yugoslavia, had a relatively

Imports
Total market

Citroen
Total Peogeot group.....

Volkswagen-Audi

General Metors-Opel

Imports
Total market

Fiat/Lancia/Autobianchi .

Alfa Romeo LEADING IMPORTS

Peugeot/Citroeu/Talbot ...

Ford General Motors-Opel

Peureot-Taibet ...

Domestic

DOMESTIC

Renault Volkswagen-Audi

LEADING IMPORTS

FRANCE

1985

584,595 65.25 311,293 34.75

199,218 22,24 116,935 13.05 316,145 35.29 268,430 29.96

66,274 7.46 67,728 7.56 42,077 4.70

599,679 60,40

393,151 39.60 992,830 100.00

522,141 52.60 64,828 6.50

for really cheap new cars in the US. To start with, Mitsu-bishi owns 15 per cent of Hyundai and supplies the Korean company with a great deal of technology under licence

Mitsubishi also intends to sell a version of the Excel through its own dealers in the States. General Motors, which dominates the US car market, is importing small cars from its

Japanese associates, Isuzu and Suzuki, and selling them at rock-bottom prices through its Chevrolet dealer network as the Spectrum and Sprint.

the same months of 1985, and 35,700 Suzuki-produced Sprints, up from 8,600.

By those standards, the other new "cheapie," the Yugo, launched with a base price of

1986 %

595,341 63.50 341,471 36.50

936,812 108.00

199,711 21.39 108,151 11.50 307,862 32.89 287,471 30.79

642,059 62.10 392,051 37.90 1,034,110 100.09

553,316 53.50 67,961 6.60

version of its old Chevrolet Chevette at \$4,995. GM has also lined up another South Korean import for 1988 which will be built by its Daewoo associate there and sold in the US with a Pontiac badge. Not to be left out, Ford has bought 10 per cent of South Korea's Kia company for \$30m and intends to import into the US a Kia model to be sold as the Ford Festiva.

Meanwhile, the Japanese still make progress in the US. In the first half of this year sales of cars imported from Japan moved up from just over 1m in the same months of 1985 to

about 1.1m. However, the big three, Toyota, Nissan and Honda, gave up some volume to make way for those "captive" imports by GM from Isuzu and Suzuki, and for substantial increases by Mazda and Subaru.

When made-in-America cars are taken into account, Honda has been firmly established as the top-selling Japanese marque in the US and sells nearly twice as many cars in the States as

Buoyed by major cheapfinance incentives for customers, total US car sales in the first total OS car sales in the first half of this year improved mar-ginally, by 0.3 per cent, com-pared with the January-June period of 1985, to 5.65m.

However, while imports rose by 14.5 per cent, sales of US-built cars fell by more than 4 per cent. Only Honda, with an 11.3 per cent rise in US-made 67,979 7.25 11.3 per cent rise in US-made 55,099 5.88 cars, and Nissan, among the US ment on the first half of 1985. Nissan's 248 per cent climb reflects the fact that it began to sell cars from its US factory only in the spring of last year Among the other US manufacturers, GM suffered a 2.57 per cent sales decline. Ford was down nearly 7 per cent, Chrysler nearly 6 per cent, Volkswagen more than 2 per cent from an already very low base and American Motors, controlled by Renault, saw sales

trolled by Renault, saw sales of US-built cars drop by nearly 44 per cent.

104,425 10.56 78,285 7.90 69,642 7.00 41,002 4.10 28,118 2.80 84,770 81,944 74.166 40,106 32,824 The world's other major car markets all experienced volume

Miles International Inc.

Notice of Redemption and Expiration of Conversion Rights to Holders of

4%% Subordinated Guaranteed Convertible Debentures Due 1993 (Guaranteed by Miles Laboratories, Inc.)

YOU ARE HEREBY NOTIFIED, pursuant to Section 4.04 of the Indenture dated as of June 15, 1968 (the "Indenture"), among Miles International Inc., a Delaware corporation ("Miles International"), Miles Laboratories, Inc., a Delaware corporation (successor by merger to Miles Laboratories, Inc., an Indiana corporation) ("Miles") and Citibank, N.A. (under its former name First National City Bank), as trustee (the "Trustee"), providing for the issue of the above-described Debentures (the "Debentures"), as amended and supplemented by the provisions of the First Supplemental Indenture dated as of January 8, 1979 (the "Supplemental Indenture"), among Miles International, Miles (under its former name Rhinechem Laboratories, Inc.) and the Trustee, that Miles International has called all of the Debentures for redemption on October 1, 1986 (the "Redemption Date"). The Debentures will be redeemed at 100.25% of the principal amount thereof plus accrued interest to the Redemption Date (the "Redemption Price") appear-

1986 (the "Redemption Date"). The Debentures will be redeemed at 100.25% of the principal amount thereof plus accrued interest to the Redemption Date (the "Redemption Price") aggregating a total of U.S. \$1,016.35 for each U.S. \$1,000 principal amount of Debentures redeemed. The Debentures will become due and payable and, upon presentation and surrender thereof (with all coupons appertaining thereto maturing after October 1, 1986), will be paid at the Redemption Price on the Redemption Date, at the option of the holder, (a) at Citibank, N.A., Bond Redemption Department, 5th Floor, 111 Wall Street, New York, New York 10043, or (b) subject to applicable laws and regulations, at the main offices of the Trustee in London (City Office). Brussels, Paris, Amsterdam, Frankfurt/Main and Milan or the main office of Banque Generals du Luxembourg S.A. in Luxembourg. Payments at the offices referred to in (b) above Generale du Luxembourg S.A. in Luxembourg. Payments at the offices referred to in (b) above shall be made by a check drawn on a bank in New York City or by transfer to a dollar account maintained by the payee with a bank in New York City. On and after the Redemption Date interest

maintained by the pavec with a bank in New York City. On and after the Redemption Date interest on the Debentures will cease to accrue.

As an alternative, pursuant to the provisions of Section 3 of the Supplemental Indenture, each U.S. \$1.000 principal amount of Debentures may be converted, at the option of the holder thereof, into the fixed amount of U.S. \$758.11 in cash (the "Conversion Price") by delivery of the Debentures (with all coupons appertaining thereto maturing after October 1, 1986) to any of the above offices, accompanied by written notice that the holder thereof elects to convert the Debentures. As promptly as practicable after the receipt of such notice and such delivery of such Debentures and coupons, there shall be delivered at said office to such holder, or on his written. Dependings. As promptly as passentiates and the receipt of such induce and such centerly of such Debentures and coupons, there shall be delivered at said office to such holder, or on his written order, a cash payment as specified above. At the close of business on the Redemption Date such

Holders of Debentures should note that the Redemption Price is larger than the Conversion

August 19, 1986

Miles International Inc.

NOTICE

Any payment made upon the redemption or conversion of the Debentures in the United States or by trunsfer to a dollar account maintained by the payee with a bank in New York City may be subject to reporting to the United States Internal Revenue Service (IRS) and to backup withholding at a rate of 20% if payees not recognized as exempt recipients fail to provide the paying agent with an executed IRS Form W-8, certifying under penalties of perjury that the payee is not a United States person or an executed IRS Form W-9, certifying under penalties of perjury the payee's trappayer identification number of social security number, it appropriate). Those holders who are required to provide their correct taxpayer identification number on Internal Revenue Service Form W-9 and who fail to do so may also be subject to a constitut of \$50. Please therefore provide the appropriate certification when presenting your penalty of \$50. Please therefore provide the appropriate certification when presenting your Debentures for redemption or conversion.

By Kenneth Gooding, Motor Industry Correspondent

modest first-half with sales of 11,840.

Some forecasters predict sales of cars with a price of under \$6,500 could reach 1m a year in the US before long.

With this in mind Chrysler has introduced Omni/Horizon America models at \$5,499 and CFW largest and the first six months of the first six months according to preliminary industry estimates, and its share of the group dist to Toyota boosted sales volume by 15.9 per cent to 181,000 in the grip of a vicious price war to preliminary industry estimates, and its share of the group dist to Toyota boosted sales volume by 15.9 per cent to 181,000 in the first six months, according to preliminary industry estimates, and its share of the group dist to Toyota boosted sales volume by 15.9 per cent to 181,000 in the first six months, according to preliminary industry estimates, and its share of the group district to 14.5 per cent to 2.9 per cent. The group has denied that this is part of a global strategy to preliminary industry estimates, and its share of the group and the first six months its share of the group and the first six months according to preliminary industry estimates, and its share of the group and the first six months its share of the group and the first six months of the first six months according to preliminary industry estimates, and its share of the group and the first six months according to preliminary industry estimates, and its share of the biggest European market.

Toyota boosted sales volume by 15.9 per cent to 181,000 in the grip of a vicious price war and its share of the biggest European market.

Toyota boosted sales volume by 15.9 per cent to 181,000 in the first six months, according to preliminary industry estimates, and its share of the biggest European market.

Toyota boosted sales volume by 15.9 per cent to 181,000 in the first six months, according to preliminary industry estimates, and its share of the biggest European market.

Toyota boosted sales volume GM is considering launching a

727,500 that European Community officials made clear their concern. The Japanese Ministry cent to 6.16m in the half-year, Japanese sales in the 17 major car markets jumped

concern. The Japanese Ministry cent to 6.16m in the half-year, of International Trade and Japanese sales in the 17 major Industry reacted by urging European car markets jumped manufacturers to exercise re-straint so as to avoid further one quarter of the 472,000 ex-

improvements in the first half of this year. In Japan, still in the grip of a vicious price war as Nissan, the second-largest group, attempted to claw background lost to Toyota, the biggest furropany, the market improved by 3 per cent company, the market may be the first six months and its share of the years cent of 1985.

The gap between Toyota and Nissan widened in the half-year while Honda continued to catch up with both of them.

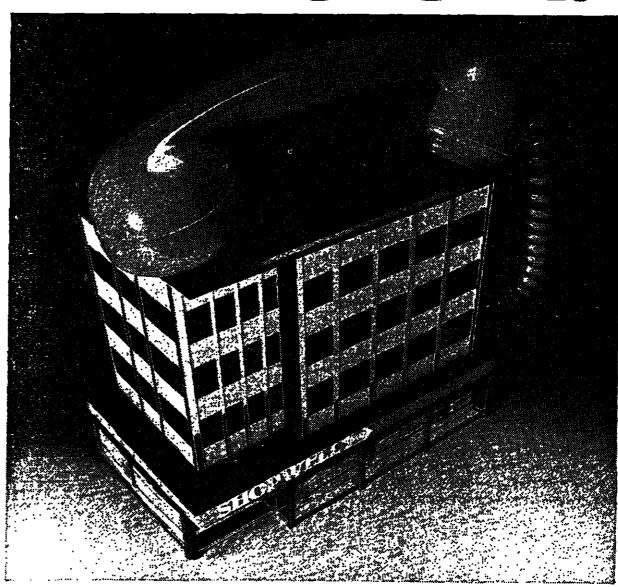
Toyota boosted sales volume by 13-per cent to 181,000 in the first six months of the year gas to uppear the visit of the first six months of the sales in the first six months of the sales increased to germany, the market mates, and its share of the Western European markets proced with the first six months of the year that half year the biggest European market is share of the western European market proced by 3 per cent company, the market in the first six months of the year that half year the biggest European market is shared to germany, the market in the first six months of the sales in the first six months are the biggest European market is shared to germany, the sales in the first six months are the biggest European market in the first six months are the biggest European market is shared to germany, the market in the first six months, scales in the first six in the first six months are the biggest European market is shared to germany, the market in the first six months, scales in the first six in the first six months is shared to germany, the the first six months of the precent to 145 per cent to 145 per cen

9.9 per cent (10.9 per cent).

Another feature of the six by 4.6 per cent to 0.94m. The Norther feature of Daimler-strong advance of Daimler-Benz, West Germany's Mercedes the R18 enabled the state-owned from West Germany, Belgium car maker, based on the intro- Renault group to recover some and Spain.

duction of two car lines, the market share in the half-year 190 "small" Mercedes and new but mainly at the expense of medium models.

market share in the half-year but mainly at the expense of its domestic rival, the Peugeot-



SHOP HEATING

Whether you're responsible for a corner shop or a chain of superstores, you can't afford to ignore the new developments in gas technology that will keep customers warm and fuel costs down. Gas is highly efficient, economical and will be still going strong

in the 21st century and onwards. For a free appraisal of how a change to gas can benefit your business. dial 100 and ask for Freefone Gas.



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R. J. REYNOLDS OVERSEAS FINANCE CO. N.V.

124% Guaranteed Notes, Due October 1, 1989 Unconditionally Guaranteed by RJR Nabisco, Inc. (formerly R. J. Reynolds Industries, Inc.)

NOTICE IS HEREBY GIVEN that, pursuant to the provisions of Paragraph 6 of the Fiscal Agency Agreement dated as of September 23, 1982, among R. J. Reynolds Overseas Finance Co. N.V. (the "Company"), as Issuer, RJR Nabisco, Inc., as Guarantor, and Morgan Guaranty Trust Company of New York, as Fiscal Agent, all of the Company's 1234° Guaranteed Notes, Due October 1, 1989 (the "Notes") presently outstanding will be redeemed on October 1, 1986 (the "Redemption Date") at a redemption price (the "Redemption Price") of 101° of the principal amount thereof. On the Redemption Date the Redemption Price will become and be due and payable upon each Note in such coin or currency of the United States of America as at the time of payment is legal tender for the payment of public and private debts therein. Payment of the Redemption Price tender for the payment of public and private debts therein. Payment of the Redemption Price will be made on and after the Redemption Date upon presentation and surrender of the Notes together with all appurtenant coupons maturing on and after October 1, 1987 at the principal offices of the Fiscal Agent in London, Brussels. Frankfurt-am-Main and Paris, the office of Swiss Bank Corporation in Basle, the office of Morgan Bank Nederland N.V. in Amsterdam and the office of Kredietbank S.A. Luxembourgenise in Luxembourg.

All interest coupons which shall have matured on or prior to October I, 1986 should be presented for payment in the usual manner. The Notes will no longer be outstanding after the Redemption Date and interest on the Notes will cease to accrue from and after the Redemption.

Necembrion Date and interest on the Notes will be void.

No payment will be made within the United States, including a payment made by transfer to an account maintained by the payee with a bank in the United States, unless payees requesting such payment establish their exempt status from the reporting and 20% withholding requirements of the United States Internal Revenue Service (IRS) by providing the paying agent with an executed IRS Form W-9 in the case of non-U.S. persons or an executed IRS Form W-9 in the case of U.S. persons. Payees who are required to provide their correct taxpayer identification number on IRS Form W-9 and who fail to do so may be subject to a penalty. Accordingly, please provide all appropriate certification when presenting the Notes for payment.

R. J. REYNOLDS OVERSEAS FINANCE CO. N.V. By: Morgan Guaranty Trust Company

Dated: August 26, 1986

NOTICE OF REDEMPTION

To the Holders of

COCA-COLA INTERNATIONAL FINANCE NV.

11%% Guaranteed Notes due 1989

NOTICE IS HEREBY GIVEN to the holders of the outstanding 11½% Guaranteed Notes due 1989 of Coca-Cola International Finance N.V. (the "Company") that, pursuant to the provisions of Section 6 of the Fiscal and Paying Agency Agreement dated as of October 1, 1982 among the Company, The Coca-Cola Company (the "Guarantor"), and Morgan Guaranty Trust Company of New York (the "Fiscal Agent") and Paragraph 5 of the Terms and Conditions of the Notes, the Company has elected to redeem on October 1, 1986 all of its outstanding Notes at a redemption price of 101.5% of the principal amount thereof plus accrued interest to the redemption date.

Payments will be made on and after October 1, 1986 against presentation and surrender of Notes with coupons due October 1, 1987 and subsequent coupons attached in U.S. dollars subject to applicable laws and regulations, either (a) at the office of the Fiscal Agent in New York City, or (b) at the main offices of the Fiscal Agent in London, Brussels and Frankfurt, Swiss Bank Corporation in Basle and Zurich, and Banque Generale du Luxembourg in Luxembourg. Payments at the offices referred to in (b) above will be made by check drawn on a dollar account maintained outside the United States and its possessions or by transfer from a dollar account maintained outside of the

United States and its possessions or by transfer from a dollar account maintained outside of the United States and its possessions to a dollar account maintained by the payee outside the United States and its possessions.

Coupons due October 1, 1986 should be detached and collected in the usual manner.

From and after October 1, 1986 the Notes will no longer be outstanding and interest thereon

Under the Interest and Dividend Tax Compliance Act of 1983, we may be required to withhold 20% of any gross payments made within the United States to certain holders who fail to provide us with, and certify under penalties of perjury, a correct taxpayer identifying number (employer identification number or social security number, as appropriate) or an exemption certificate on or before the date the securities are presented for payment. Those holders who are required to provide their correct taxpayer identification number on Internal Revenue Service Form W₂9 and who fail to do so may also be subject to a penalty of \$50. Please therefore provide the appropriate certification when presenting your securities for payment.

Morgan Grenfell Group plc

U.S. \$200,000,000

Undated Primary Capital

Floating Rate Notes

In accordance with the provisions of the Notes, notice is

hereby given that for the Interest Period from 26th August,

1986 to 26th February, 1987 the Rate of Interest will

be 61/2% per annum.

The interest payable on the relevant Interest Payment Date,

26th February, 1987, will be US\$332.22 for each

US\$10,000 Note and US\$8,305.56 for each

US\$250,000 Note.

Agent Bank:

Morgan Guaranty Trust Company of New York London

COCA-COLA INTERNATIONAL FINANCE N.V. Dated: August 26, 1986_____

> NOTICE OF EARLY REDEMPTION **ORIENT LEASING CO., LTD.**

US\$50,000,000 51/4 Convertible Bonds 1998 ("BONDS")

Notice is hereby given that in accordance with Condition 6(B) of the Terms and Conditions of the Bonds, the Company will redeem all of the outstanding Bonds at 104½ per cent of their principal amount on September 28, 1986 when interest on the Bonds will cease to accrue.

On September 25, 1986 the redemption price of 104½ per cent will become due and payable upon each Bond to be redeemed, together with accrued interest from September 30, 1985 amounting to US\$258.85 per US\$5,000 Bond.

Interest from September 30, 1985 amounting to US\$258.85 per US\$5,000 Bond.

The right to convert the Bonds Into fully paid shares of the Company will terminate on September 26, 1986, the date fixed for redemption. Bonds surrandered for conversion will not be entitled to accrued interest and shall be accompanied by the September 30, 1986 coupon and all coupons maturing thereafter. Bonds for conversion should be deposited in accordance with Condition 518(i) at the offices of the Conversion Agents specified on the Bonds or any other offices thereof changed and notified to the Bondholders, on or before September 26, 1986. The Bonds are presently convertible into truly paid shares of the Company at the price of Yen 2,860 per share. At such conversion price the holder of US\$5,000 principal amount of Bonds would receive 420 shares of the Company (usung the fixed exchange rate specified in the Conditions of Yen 240.60 equals US\$1). The reported closing price on August 19, 1986 of the shares of the Company on the Tokyo Stock Exchange was Yen 4,400 per share. At such a price, the holder of a Bond of US\$5,000 principal amount would receive upon conversion 420 shares having an aggregate value of Yen 1,848,000. The aggregate principal amount of the Bonds outstanding as at the closing of August 18, 1986 was US\$44,315,000.

Failure to deposit Bonds for conversion on or before September 26, 1986 will automatically result in redemption at a price (including premium and accured interest) of US\$5,483.85 for each US\$5,000 principal amount of Bonds.

Payment of the redemption prices will be made upon presentation of the Bonds with all unmatured Coupons appertaining thereto at the Offices of any one of the Paying Agents mentioned thereon or any other offices thereof changed and notified to the Bondholders.

ORIENT LEASING CO., LTD.
BY: THE CHASE MANHATTAN BANK, N.A.
London, Principal Paying Agent

UK NEWS

Joan Gray reports on one aspect of the City revolution

Big Bang boom for builders

FROM a road junction close to the Financial Times' offices in the City of London, it is possible to see six office blocks covered with scaffolding; behind rise three tower cranes on the site that will be the Royal Bank of Canada's new offices; nearby, the second largest tower crane in Europe is at work on the stock

These developments are part of an office building boom in anticipation of the Big Bang in October, when the City will be deregulated. Every possible square foot of space is being pressed into use as buildings are updated for the computer technology of the financial revolu-

"The space is just too valuable to waste," said Mr Terry Hallam, se-nior partner of Matthews and Goodman, the surveyors for British Rail and Speyhawk's £100m-plus scheme to build offices in the air space over the railway tracks down to the river Thames at the back of Cannon Street Station.

The space over the tracks at Charing Cross station, further west, is also to be built over, in a £100m development which architect Mr Terry Farrell describes as a new 'palace" on the river. It will have a dealing floor the size of Wembley football pitch with space for 792

The space over and around Liver-pool Street Station is already being Confederation. But he added: "I do linked to the Big Beng, Ove Arup's transformed into a financial centre in a 5300m scheme which is the largest building project in the City be seen from a survey of the most worth £100m this year.

since the rebuilding which followed

the Great Fire of London in 1666.

Gallery under the roof.

23 per cent rise in the beginning of

ures for orders for new comm

quarter last year.

The Department of Industry's fig-

building show an increase from

£2.9bn in 1983 to £35bn in 1985, at

current prices, with orders for the

first quarter of 1986 worth £904m

compared to £763m for the same

the value of building work done by

our members in the City of Lon-

"There are no collected figures on

important office building projects in the City carried out by the trade Even London's old fish market magazine Construction News. Victorian Billingsgate down by the The 24 major projects for which it river - is being transformed into a could quote prices added up to work dealing centre for Citicorp Investment Bank. It has room for 450 worth more than £630m for the condealers in the cast-iron colonnaded

This takes no account of the work ground floor which was the main under progress south of the river, arket hall, another 150 in the where John Laing is building the brick-arched basement which was £100m London Bridge City; or of dethe refrigerated fish store, and offices for senior staff in the Haddock velopments such as the plans for Charing Cross Station; or of work in the growing new financial centre of Docklands in the East End of Lonory Milln, the analyst, estimates that there was a 30 per cent don, where Mr Michie estimates his real rise in commercial building between 1981 and 1985, followed by a

> Analyst Mr Jamie Stevenson of Wood Mackenzie estimates that there is at least another £3.5bn of work to come from Docklands, with the £2bn planned Canary Wharf financial offices development being the largest element.

worth "the lion's share of £1.2bn."

The City building boom has al-ready had a healthy impact on the contractor's workloads. Trollope and Colls - with a turn-

over of £150m a year - estimates said Mr Brian Michie, econo-that 25 per cent of its workload

know our members are doing very workload in the Square Mile has risen from 40 projects with a value well in the City."

Just how well they are doing can

of 550m last year to 69 projects

of 550m last year to 69 projects

> Mr Philip Beck, chairman of Mowlem, estimates that his turnover in management contracting the form of construction contract fa youred by commercial clients who want buildings at high speed - has risen from £30m in 1985 to £90m in 1986; John Laing's management contracting output has tripled in the last five years to £130m a year

It is not only the big contra which have benefited. Mr Eddie Clark is managing director of Laden Engineering, which supplied the 45-ton crane Mrs Margaret Thatchmembers are carrying out contracts er, the Prime Minister, drove to inaugurate the first phases of the £136m Broadgate financial office centre near Liverpool Street Sta-

> He is also supplying the 450-ton crane - the largest at work in the City - being used to install the power station, cooling and air condition ing systems needed for the Stock Exchange's computerised share information system.

> Mr Clark estimates that "the Big Bang has brought us in an extra £1m work on a purpover of £5m."

Aid sought for black S. African school plan

By Hazel Duffy

BRITISH industrialists with interests in South Africa are seeking support for a scheme to provide ed ucation in British, German and US universities for about 5,000 South African blacks and coloureds.

The idea came from Sir Leslie Smith, chairman of the British Industry Committee which represents 54 companies with South African interests. Sir Leslie, chairman of British Oxygen, is opposed to eco-nomic sanctions because be be-lieves they would further entrench the Botha Government's resistance to ending spartheid and reduce the lards of blacks and co-

He will be having talks next month with his counterparts in West Germany and the US aimed at positive towards preparing non-whites for responsible positions in South African institutions and the economy.

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Section 1

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e., .

The dangers of the education idea are that industrialists would be seen as trying to set up a class of black capitalists.

FT COMMERCIAL LAW REPORTS

Digest of cases reported in the Trinity Term

appointed Mr Ash its voluntary liquidator. He was displaced some 16 months later by a compulsory winding up order amid allegations that he had dissipated the company's assets. In dismissing a motion to discharge the registrar's order regarding Mr Ashworth's remuneration, Mr Justice Hoffmann said that the court's power to fix remuneration derived from Rule 195 of the Companies (Winding-up) Rules 1949 "where the company has previously commenced to be wound up voluntarily." A voluntary liquidator could apply under the Rule where he had been duly appointed and then superseded by a compulsory order. Moreover he was entitled to priority for expenses incurred before the commencement of the winding-up. To insist on a strict cut-off in point of time would create a trap for the unwary and could not have been the legislative intention. Allega-tions of negligence could not be

In re John T. Rhodes Ltd (FT.

After the winding-up of the company, the liquidator, who needed to clarify many out-standing matters, obtained an order under section 268 of the Companies Act 1948 to examine an oath a former de facto director, Mr Hayward. In refusing to discharge the order at Mr Hayward's behest, Mr Justice Hoffmann stated that persons involved in the affairs of an insolvent company owed a public duty to assist the liquidator to investigate the company's affairs in the interests of creditors. That duty was particularly strong in the case of those closely involved in the conduct of the company's business. The registrar's order was not oppressive, vexatious or unfair, and should be upheld.

Gur Corporation v The Trust Bank of Africa Ltd and another (FT, July 29)

tions of negligence could not be
investigated in fixing the reinvestigated in fixing the reinvestigated in favour of the
Department of Public Works in the Republic of Ciskei, the question arose over the locus stands of the Government of Ciskei, an independent "homeland," which was set up by the South African Government in 1981, and which the British Government refused to recognise. In allowing an appeal by the Trust Bank of Africa against a first instance decision that the Ciskei had no locus standi the Court instance decision that the Ciskei had no locus standi, the Court of Appeal held that although the English courts could not treat it as a sovereign state it had locus standi to appear in English proceedings as a subordinate body which the South African Government had set up to act on its behalf. to act on its behalf. R. Paguan & Fratelli v Fina-

grain Compagnie Commerciale Agricole et Financiere SA. (FT.

July 301

A contract for the sale of maize provided that loading time was "to count as per Centrocon charterparty." The charterparty incorporated Centrocon's clause 30 to the effect that if the cargo could not be loaded by "reason of a strike... or ... obstructions... beyond the control of the charterers... time for loading shall not count..." The Argentinian sellers nominated an upriver port of the River Parana, on

In re A. V. Sorge & Co Ltd muneration of the liquidator Appeal awarded the buyers (FT. July 24) and could only be pursued by \$45,853 demurrage. In allowing the sellers' appeal, Mr Justice Staughton stated that "time to count as per Centrocon charterparty" referred to all provi-sions as to when time should and should not count, including erial clause. "Obstructions" in the clause covered congestion in a port and was no less apt to cover ordinary than extraordinary congestion.

South Carolina Insurance Co v Assurantie Maatschappij "De Zeven Provincien" NV; South Carolina Insurance Co v Al Ahlia Insurance Co and Anothe (FT, August 1. International edition, August 5) In upholding injunctions against the defendants restrain-

ing them from obtaining discovery of documents abroad, the Court of Appeal based its decision on three grounds, viz:
(i) that the English court
should retain control of its own
process; (ii) that US civil procedure was markedly different and the parties should be regarded as having accepted English procedure when they submitted to local jurisdiction; and (iii) unrestrained access to foreign procedural remedies was of considerable would increase costs. In over-turning this decision, the House were conflicting of Lords held that with regard to process and procedure, the defendants were merely trying to obtain abroad, by lawful means, documentary evidence needed to present their case.

damaged two underground cables belonging to the plaintiff. The damage was made good in 1976. A writ was issued in 1978 pursuant to section 26 of the Public Utilities Act 1950 that compensation was payable "equal to expense reasonably incurred." The Court of Appeal held that the action was statute-barred as time had begun to run from the date of the damage and not from the date of its age and not from the date of its repair. In overruling this decision, the House of Lords stated A debenture charged as a that if an enactment gave a first specific charge "all book right to recover expenses, the debts and other debts owing to cause of action accrued only Brightlife." A sub-clause

the same event might have given action under statute or common law, accruing at some earlier date.

arbitrators said that the issue was or considerable practical importance since there were conflicting decisions between London maritime arbi-

trators. The charterers, who had been held liable, unsuccessdefendants were merely trying to obtain abroad, by lawful means, documentary evidence needed to present their case. Any liability for increased costs that South Carolina had incurred was self-imposed.

Ross v Lord Advocate and Others; Trustee Savings Bank Central Board and Others (FT, Angust 5)

The question in these two actions, one English and one Scottish, brought by depositors of the Trustee Savings Bank, was whether the depositors other than the right to receive back their deposits together

in 1971, while laying ducts by giving the majority sharefor the Post Office, contractors holders the statutory power to remove the minority share-holder as director and entitling them to buy his shares at fair value. The petitioner, who had machinery in determining the fair value of his shareholding, should not be entitled to complain of unfair conduct in the circumstances and his petition should be struck out.

Re Brightlife Ltd (FT, August 13)

when the expenses were created a floating charge over incurred, notwithstanding that Brightlife's assets and property. The debenture further stated that the floating charge could be created into a specific charge at any time by notice. Mr Justice Hoffmann stated that as Aden Refinery Company Ltd v notice of the conversion of the Ugland Management Co Ltd. floating charge into a specific (FT, August 8 International one had been given before the edition, August 11) winding up, the debt secured by the debenture ranked in priority to the preferential construction of a clause of an debts in respect of all assets in the hands of the liquidator. Events of crystallisation could be fixed by agreement as well as by law and it was not open to the courts to restrict the contractual freedom of parties to a floating charge on the grounds of public policy.

Zambia Steel and Building Supplies Limited v James Clark and Eaton Limited (FT, August

An agreement for the sale of sheet glass was concluded partly in writing and partly by subsequent oral agreement. On the back of the document the sellers stated that "disputes ... to be settled by arbitration in England." Although the plaintiff buyers did not assent to this tiff buyers did not assent to this term in writing, the Court of Appeal held, once it was clear that the document formed part of their agreement, section 7 of the Arbitration Act 1975, which specifies that an "arbitration agreement" means an agreement in writing to submit to arbitration . " was satisfied. Examination of the authorities showed that if a document with an arbitration clause in writing formed part of A contract for the sale of maize provided that loading time was "to count as per Centrocon charterparty." The charterparty incorporated Centrocon's clause 30 to the effect that if the cargo could not be loaded by "reason of a strike . . or . . . obstructions . . . beyond the control of the charterpers . . . time for loading shall not count . . ." The Argentinian sellers nominated an upriver port of the River Parana, on which congestion was endemic. Loading time was exceeded by 50 days and a Gafta Board of PLC and Others (FT, August 6)

any interest in the TSB's assets odiscretion judicially. The treath to receive back their deposits to gether than the right to receive back their deposits together back their deposits together with interest. Under the Trustee Savings Banks Act 1981, which specifies that an "arbitration of the control of the charterparty incorporate quasi-statute, no depositor was entitled to anything other than the right to receive back their deposits together with interest. Under the Trustee Savings Banks Act 1981, which specifies that if there was an irretrievable breakdown in relations between members of a corporate quasi-statute, no depositor was entitled to anything other than the right to receive back their deposits together with interest. Under the Trustee Savings Banks Act 1981, which specifies that if there was an irretrievable breakdown in relations between members of a corporate quasi-statute, no depositor was entitled to anything other than the right to gether with interest. Under the Trustee Savings Banks Act 1981, which specifies that if there was an irretrievable breakdown in relations between members of a corporate quasi-statute, no depositor was entitled to anything other than the right to gether with interest. Lord (FT, August 12)

It was unacceptable that if there was an irretrievable of the corporate quasi-statute, no depositor was entitled to anything other than the right to recive was an irretrievable of there was in irretrievable of a corporate quasi-statute, no depositor w

ADVERTISEMENT

The International Corona Group of Companies







August 26, 1986



Corporation; Mascot Gold Mines Limited.



Gil Leathley







national Corona Resources Ltd., and Royex Gold Mining Corporation; Chairman of the Board of Mascot Gold Mines Limited, is pleased to announce the appointment of Gil Leathley as Senior Vice-President, Operations of International Corona Resources Ltd. and Royex Gold Mining Corporation. Mr. Leathley will join the existing Corona Group Management Team

which also includes: Theodore E. Rhenius, Senior Vice-President and Chief Financial Officer of International Corona Resources Ltd.; Royex Gold Mining

Henry Ewanchuk, President and Chief Executive Officer of Mascot Gold Mines Limited; Senior Vice-President, Exploration of International Corona Resources Ltd.; Royex Gold Mining Corporation. Anthony P. Walsh, Corporate Controller of International Corona

Resources Ltd.; Royex Gold Mining Corporation. Shirley A. Kozel, Corporate Secretary of International Corona Resources Ltd.; Royex Gold Mining Corporation; Mascot Gold Mines

Hans Pump, Controller-Operations of International Corona Resources

Ltd.; Royex Gold Mining Corporation.

International Corona, an independent gold mining company with substantial interests in the Hemlo area, is also the largest shareholder in Royex Gold Mining Corporation, a public company engaged in the exploration, development and management of gold properties in North America. Royex is the largest shareholder of International Corona, with a controlling interest in Mascot Gold Mines Limited. It also owns 50% of and manages the Renable Gold Mine joint venture. Mascot is currently developing a major gold mine near Hedley, B.C., and is the exploration arm of the International

UK NEWS

Thatcher

to visit

Moscow

next year

MRS MARGARET Thatcher, the

Prime Minister, has formally ac-

cepted an invitation to visit Moscow

next year for talks with Mr Mikhail

Gorbachev, the Soviet leader, Mi-

The visit, first suggested during

the recent trip to Britain by Mr Ed-

uard Shevardnadze, the Soviet For-

eign Minister, will be Mrs Thatch-

She attended the funeral last year

of Mr Konstantin Chernenko, the

Mrs Thatcher has written to Mr

The timing of the visit will inevi-

tably give rise to speculation about the date of the next general election

in Britain, given the potential electoral boost for any prime minister undertaking such a top-level

□ JOHN BROWN Engineers has

teamed up with Aker Engineering

of Norway to set up joint companies

to handle the management, design and engineering of offshore pro-

Initially, the companies will work

in the UK and Norway, but the agreement is aimed at leading the

way to broader co-operation in the

John Brown, part of Trafalgar House, will hold 55 per cent of a

London-based company, John Brown-Aker, and Aker will own the rest. In Oslo, the holdings will be re-

international offshore market.

Gorbachev, suggesting that the two leaders fix a date for some time

chael Cassell writes.

former Soviet leader.

during 1987.

Tin brokers say ITC members acted unlawfully

BY ANDREW GOWERS

A GROUP of 11 London Metal Ex-A GROUP of 11 London Metal Exchange brokers has formally accused the 22 member governments of the International Tin Council (ITC) of acting uplearfully and international Tin Council (ITC) of acting uplearfully and international Tin Council (ITC) and international Tin Council (ITC) acting uplearfully and international Tin Council (ITC) and international cused the 22 member governments of the International Tin Council (ITC) of acting unlawfully and irresponsibly in the events surrounding the tin crisis.

The brokers have grouped together under the name of Tinco Realisations to attempt to recover losses to-talling about £400m which they sus-fained when the tin market col-debts and that they were all well lapsed in March, They made their claims in a briefing document published at the weekend and circulated to trade ministers of the ITC member countries, including Brit-

The release of the document marks the latest attempt by Tinco Realisations to put public pressure on ITC members to admit liability for the council's debts on which it effectively defaulted when its price support operation in the tin market

collapsed last October. The brokers clearly remain anxious to reach an out-of-court settlement if possible, though they reiter the Government to "intercede diploate in the new document that they have received "the strongest legal advice concerning the culpability national arbitration or to the Inter-and liability of the member states, and it is difficult to imagine the the ITCs own immunity from member states receiving contrary prosecution created by its Head-

BY LUCY KELLAWAY

another round of petrol price rises

which is expected to raise pump

prices by about 7p to a typical

charge of 170p or more a gallon.

The move, which is expected

within the next week, is likely to go

ahead despite the criticism which

accompanied the last rise, an-

The second rise is likely to be

blamed on the recent increase in

crude oil prices. Oil companies said

that the 7p increase announced two

weeks ago took no account of high-

or crude oil prices, but was a much needed correction to the steady ero-

nounced earlier this month.

Petrol prices likely to

rise by 7p a gallon

seem certain to follow if no accommodation is reached.

The ITC itself has no assets left, so aggrieved brokers and bankers are setting out to prove that individaware of the precarious state of the council's finances for several years before it collapsed.

Tinco says that it will not necessarily sue all member governments, but is looking for "countries in which it is most appropriate to bring proceedings to establish the liability of the member states." The UK is thought to be a prime target. Mr Paul Channon, the UK Trade

and Industry Secretary, has stated repeatedly that the Government does not accept liability and that it will fight any legal actions.

In its document Tinco called on

matically or informally" on its behalf: to submit the dispute to interquarters Agreement with the UK.

necessary by the end of the monta

to reflect higher crude prices. In the

last four weeks crude oil has risen

from about \$10 a barrel to about

Editorial comment, Page 12; Lombard Page 13

level at the start of the year.

versed in the other company, Aker-John Brown.

☐ THE LABOUR Party is considering the creation of a new tier of regional councils as part of proposals for restructuring local government in England and Wales.

OIL COMPANIES are preparing for sion of petrol prices in the past few The plan, aimed at streamlining the present system of local govern-At an average price of 157p a galment and improving democratic lon, oil companies claimed that they were making little, if any, profit control at regional level, could in-volve the abolition of the 47 existing from selling petrol.

At the time of the first rise, BP gave a warning that another increase in petrol prices would be county councils and their replacement by up to 12 regional authori-

☐ HORIZON TRAVEL, Britain's third biggest tour operator, made a further attack in the holiday price war with the publication of revised winter brochures.

\$14, although it is still only half the Some skiing holidays have been reduced by up to £60 with price cuts of up to £71 and the addition of an

Cereals harvest expected to be good in both yield and quality

BY JOHN CHERRINGTON

farmers have been surprised by the yield and quality of the crops. Some believe it could be a vintage year

Most fields of wheat, in particular, appear to be of a very high standard, according to an informal survev at the weekend.

The quality of the crops is good,

considering that autumn-sown fields of wheat, barley and oilseed rape suffered badly from poor weather in winter and late spring. Many were then thought to need re-

Wheat has recovered well in many parts of the country from ear-record. Wheat plantings have risen European Community.

THE BRITISH cereals harvest has by thinning. Oilseed rape yields are by 4.6 per cent this year to 1.99m started slowly this year, but most reported to be a good average. Spring-sown barley has been yield-

ng very well.

The only disappointing reports have come from farmers growing autumn-sown barley, where yields have been unremarkable. But three quarters of the crop is still in the fields being battered by poor weather, and losses of both

yield and quality could yet be substantial. The Home-Grown Cereals Authority said earlier this year that, if

vields were as high as in the bumper year of 1984, the 1986 harvest particularly of wheat - could set a

The 1984 UK grain harvest toproduction fell to 22.47m tonne If there is another large British harvest, it will add to the already

bulging stores of surplus grain. Heavy supplies may also diminish the premiums which might other-wise be earned by quality milling wheats, and the official intervention stores may turn out to be the destination of much of this grain.

But for some cereals, demand particularly for export - is healthy owing to drought elsewhere in the

Foden competes for army deal

BY KENNETH GOODING, MOTOR INDUSTRY CORRESPONDENT

FODEN, the subsidiary of Paccar of ministry to make up its mind before the US, is waiting for an announce-ment about a contract from the Ministry of Defence for 2,000 heavy trucks worth about £250m.

Foden is one of the two front runners in the race for the contract. The other is Scammell, the specialist vehicle producer within the state-owned Rover group (formerly

BL). Both companies would use Rolls-Royce 350 diesel engines, now pro-duced in Britain by Perkins, owned by Variety Corporation (formerly Massey Ferguson) of Canada. Mr Mark Pigott, managing direc-

the end of this year. Some observers believe the contract will be split between the two contenders. Mr Pigott admits that that is a possibility, but says he has had no indication of the outcome. The companies have been asked

to tender to provide vehicles for the British Army's Drops (Demountable, rack, off-loading and pick-up system) to meet the requirement for faster supply of ammunition between depot and front line.

Drops vehicles not only will be able to cover all types of terrain at Mr Mark Pigott, managing director of Foden, says he expects the load and unload tons of ammunition

in under one minute. The army will want the 2,000 trucks supplied over five years, starting in 1988 or 1989. Foden, which employes 450 people, produced about 550 heavy trucks (over 24 tonnes gross weight) last year, as well as about 100 mili

loss (after tax) of £553,000, down from a loss of £1.43m the previous

Mr Pigott says that Foden is operating profitably. The most recent ly filed accounts for Paccar UK, the major asset of which is Foden, show that in 1984 it suffered a net

The further tranches of 11 per cent Exchaquer Loan, 1990 and 10 per cent Conversion Stock, 1996 will rank for a full six months' interest on 12th February 1987 and 15th November 1986 respectively. The further tranche of 92 per cent Treasury Stock, 2002 has been issued on an ex-divident basis and will not rank for the interest payment due on 27th August 1986 on the existing Stock. Official dealings in the Stocks on The Stock Exchange are expected to commence on Tuesday, 26th August 1986. military vehicles should rise to

11 per cent Exchequer Loan, 1990

92 per cent Treasury Stock, 2002

Each of the Stocks referred to in this notice is specified under paragraph of Schedule 2 to the Capital Gains Tax Act 1979 as a gift-edged securit funder current legislation exempt from tax on capital gains, irrespective of the period for which the Stock is held).

THIS NOTICE DOES NOT CONSTITUTE AN OFFER FOR SALE AND THE STOCKS LISTED BELOW ARE NOT AVAILABLE FOR PURCHASE DIRECT FROM THE BANK OF ENGLAND.

ISSUES OF GOVERNMENT STOCK

The Bank of England ennounces that Her Majesty's Treasury has created of 22nd August 1985, and has assued to the Bank, additional amounts a sudcated of each of the following Stocks:

£200 million 11 per cent EXCHEQUER LOAN, 1990
£150 million 10 per cent CONVERSION STOCK, 1996
£150 million 92 per cent TREASURY STOCK, 2002

The price paid by the Bank on issue was in each case the middle market closing price of the relevant Stock on 22nd August 1985 as certified by the

In addition, Her Majesty's Treasury has created on 22nd August 1986, and has issued to the National Debt Commissioners for pubble funds under their management, additional amounts as indicated of each of the following Stocks:

In each case, the amount issued on 22nd August 1986 represents a further tranche of the relevant Stock, ranking in all respects part passu with that Stock and subject to the terms and conditions applicable to that Stock, and subject also to the provision contained in the final paragraph of this notice; the current provisions for Capital Gaits Tax are described below.

Application has been made to the Council of The Stock Exchange for esciurther tranche of stock to be admitted to the Official List.

Copies of the prospectuses for 11 per cent Exchequer Loan, 1990 dated 8th February 1985, 101 per cent Exchequer Convertible Stock, 1989 dated 22nd November 1985 (which contained the terms of issue of 10 per cent Conversion Stock, 1996) and 92 per cent Treasury Stock, 2002 dated 12th August 1985 may be obtained at the Bank of England, New Issues, Watling Street, London, EC4M 9AA.

The Stocks are repayable at par, and interest is payable half-yearly, on the

27th August 2002

12th February 12th August

15th May 15th Novembe

£100 million 11 per cent EXCHEQUER STOCK, 1989 £100 million 104 per cent EXCHEQUER STOCK, 1987

Government statement
Attention is drawn to the statement issued by Her Majesty's Treasury on 29th May 1985 which explained that, in the interest of the orderly conduct of fiscal policy, neither Her Majesty's Government nor the Bank of England or their respective servants or agents undertake to disclose tax changes decided on but not yet announced, even where they may specifically affect the terms on which, or the conditions under which, these further tranches of stock are issued or sold by or on behalf of the Government or the Bank; that no responsibility can therefore be accepted for any ornission to make such disclosure; and that such ornission shall neither render any transaction liable to be set aside nor give rise to any claim for compensation.

BANK OF ENGLAND LONDON

22nd August 1986

TSB to announce flotation timetable

BY DAVID LASCELLES, BANKING CORRESPONDENT

to be announced tomorrow with the release of the pathfinder prospectus by Lazard Brothers, the bank's merchant bank advisors.

way for the UK's largest issue of bank shares by giving detailed financial information about the TSB

THE EXACT timetable for the flota-tion of the Trustee Savings Bank is The issue, due for mid-Septem-have to be deducted about £170m to ber, is expected to raise in excess of cover issue costs and account for 11bn for the Trustee Savings Bank. shares being handed out free to em-Lazards have been working on as- ployees or earmarked for a special sumptions ranging as high as loyalty fund to reward shareholders The document will also pave the £1.65bn, though a more likely range who keep their shares for three vay for the UK's largest issue of is thought by the City of London to years after the flotation. be £1.2bn-£1.4bn.

will be missing - the price of the issue which will not be decided until this year - a ratio in line with the their money in building societies, it "impact day" after which there will other big clearing banks - the issue will probably emphasise the yield be about 10 days for investors to would yield a total of £1.3bn. as a familiar measure.

Many of Lazards' calculations are The key factors in the pricing will also based on the assumption that and making a forecast of the group's profits for its current financial year.

be the levels at which other bank the dividend will yield about 5.5 per stocks are selling and the yields cent, again broadly in line with the cial year. One crucial piece of information shares are priced at seven times its seeking many private shareholders

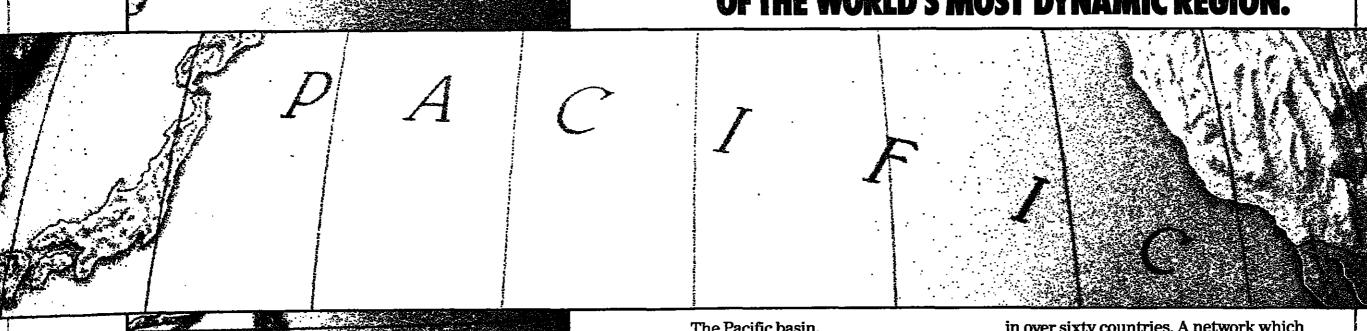
THE FINANCIAL TIMES is proposing to publish a survey on

EMPLOYEE WELFARE Friday, September 19, 1986 For further information please contact:

MARK FISHER on 01-248 8000 ext 3389 **FINANCIALTIMES EUROPE'S BUSINESS NEWSPAPER**



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IPS heralds a new scale of risk funding

BY WILLIAM DAWKINS

icy drizzle, visitors to Integrated Power Semiconductors' blue

share of the world market for its products and is run by an experienced team of executives with long track records in top electronics groups like National Semiconductor, Motorola and

Texas Instruments.
Yet rather than being in Silicon Valley, IPS is in the heart of Scotland's Silicon Glen in the new town of Livingston. IPS is the largest UK stant-up ever financed by British venture capital unless one counts Euro-pean Silicon Structures, the pan-European semiconductor business which has pulled in f-19m since its launch last

The Livingston company, how-ever, has gone far enough down the road to commercial reality to provide a telling illustration of the way British risk investors are getting to grips with handling a giant high technology start-up that demands financing techniques only just beginning to be accepted in the City of

IPS has so far raised £14.5m of equity finance in three successive rounds of funding, an successive rounds of funding, an ambitious arrangement for a venture capital industry that until recently tended to stick to single tranches of cash. Semi-conductor making is so capital intensive—IPS has spent £6.5m on equipment alone—that the Scottish venture could hardly have got away with less.

No British venture capital

have got away with less.

No British venture capital group is big enough to stump up that kind of money on its one own, so syndication was the only answer. However, the idea of ing to pick up a vast market working as a team with competifor UK venture capital funds which were only just starting to build up the efficient networks which are such a strong works which are such a strong feature of risk financing in the US. Their caution in this respect is one reason why IPS has been backed by an unwieldy dribs and drabs by both sides," condition that he raised the he explains. According to Datach h tors took some getting used to for UK venture capital funds

WERE IT not for the persistent consortium of 16 institutions:

founder and managing director, who was getting increasingly stretched as the company started to get off the ground.

Smartpower

It comes as no surprise that Wood, appropriately a Californian, met extreme difficulty British venture capitalists in US hotel lobbies, dreamed up IPS while working as engineering director for Silicon General, Californian semiconductor producer.

circuit boards with devices the size of a pen top, or smartpower

ing to pick up a vast market that is only being served in dribs and drabs by both sides," he explains. According to Data-

Keeping that group fully devices can be used in many informed has been a significant burden for IPS.

There have, on the other troically. One example of an IPS design is a chip which a comparically enables a disk recently most of the world market for informed has been a significant burden for IPS.

There have, on the other hand, been compensations.

They will find a two-year-old start-up that has so far swallowed just over £30m in the deal—which setting out to take a significant share of the world market for the deal—which start-up that has so far swallowed just over £30m in the deal—which setting out to take a significant share of the world market for the deal—which setting out to take a significant share of the world market for the deal—which split second after a power failure.

There have, on the other tronically. One example of an IPS design is a chip which automatically enables a disk drive to store the contents of a computer's memory in the split second after a power failure.

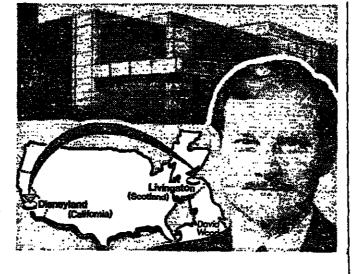
But why Britain? "I wanted the deal which is split second after a power failure.

man, Jack Armstrong, better known as managing director of the European components subsidiary of the US automation group, Allen-Bradley.

An important part of Armstrong's job is to communicate between the company and its myriad investors, a task which was getting too much for David Wood, PS's 42-year-old founder and managing director. But why Britain? "I wanted semiconductor imports into member states — an extremely handy buffer against non-EEC competition for European start-

Wood knew from the start that he would have to work full-time to persuade Britain's venture capitalists to back such venture capitalists to back such needed to raise finance, a coran unusual plan. So he left needed to raise finance, a coran unusual plan. So he left needed to raise finance, a coran unusual plan. So he left needed to raise finance, a coran unusual plan. So he left needed to raise finance, a coran unusual plan. So he left needed to raise finance, a coran unusual plan. So he left needed to raise finance, a coran unusual plan. So he left needed to raise finance, a coran unusual plan. So he left needed to raise finance, a coran unusual plan. So he left needed to raise finance, a coran unusual plan. So he left needed to raise finance, a coran unusual plan. So he left needed to raise finance, a coran unusual plan. So he left needed to raise finance, a coran unusual plan. So he left needed to raise finance, a coran unusual plan. So he left needed to raise finance, a coran unusual plan. So he left needed to raise finance, a coran unusual plan. So he left needed to raise finance, a coran unusual plan. So he left needed to raise finance, a coran unusual plan needed to raise finance, a cora spend the next 16 months sur-viving on the proceeds of the fornian, met extreme difficulty silicon General share options in persuading the City to back which had been part of his his plan for the first significant remuneration. These enabled UK semiconductor maker since the birth of the troubled Inmos in 1978. Wood who are the birth of the troubled Inmos own money for seed equity, the in 1978. Wood, who even kind of commitment which resorted to ambushing visiting would normally make British risk investors come flocking.

to identify 12 senior US semiconductor executives - now the core of the 130-strong business — prepared to follow him on



£5m round was in place and was always there—it was just a IPS was able to start marketing question of price," says Wood. semiconductors made under By round three—£4m in June contract by Motorola in France.—the semiconductor industry's IPS was able to start marketing semiconductors made under contract by Motorola in France. Starting in a rented office near Disneyland, the group moved into the basement of Livingston Development Corporation's headquarters before its £6m Development leased factory was finally ready by last November.

But in the two-year period The strategy was (and remains) to build up credibility and a dependable revenue base by establishing IPS as a second source for existing chip designs. Proprietary IPS products would come later.

Second round

"Certainly, everybody wanted to hear about it. The difficulty was the size of the money and the idea of having planned stages of financing," recalls Wood.

After spending another \$100,000 or so criss-crossing the Atlantic (when the share options ran out, his wife sold her Corvette sports car) Wood eventually won the support of Peter English, then a 3i Venture executive.

It was less difficult for Wood distributors were supposed to

It was less difficult for Wood to identify 12 senior US semi-conductor executives — now the core of the 130-strong business - prepared to follow him on half, with new products doing The second challenge is for condition that he raised the better than expected. All this IPS to get established before

depression had stubbornly re

depression had stubbornly refused to end, but Wood and his
team could ill afford to spend
days pleading their case in the
City all over again.
Accordingly, they took a risk
and simply asked existing shareholders, to put up the cash
through a rights issue. All but
one, Alan Patricof Associates,
agreed. Wood admits that the
semiconductor industry's problems, allied with the fact that
equipment leasing was far lems, allied with the fact that equipment leasing was far harder to get than he had imagined, has forced IPS to raise £2.5m more equity than planned. But he maintains that he is still on track to break even as budgeted by the middle of next year and make a profit in the 12 months to March 1988. the 12 months to March 1988, when sales are expected to hit

"There is no reason that we cannot do £100m sales by 1991, We know the market exists and we have the technology," Wood says bravely. In the meantime, however, IPS faces two more important challenges.

The first is to keep this cash-hungry venture funded until it passes its £15m annual sales break even point. Wood is now busy lobbying larger electronics companies, rather than venture institutions, for contributions to what is planned to be the final financing round before a public flotation.

The second challenge is for any larger group even better equipped than the Livingston company to achieve the economies of scale so important to semiconductor making fol-lows it too closely into smart-power. Says Wood: "We'll just have to move fast on our feet."

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In brief...

A NEW source of help for first time microcomputer users in trouble emerged last week with the launch of the newly formed Small Business

Support Group. Based in Based in Broadway, Worcestershire, the group consists of six mirerocomputer software experts who aim to provide instant telephone assistance for buyers of most makes of micros available in high street shops running on popular packaged software. The service is designed for small business-men who have been entired by the rapid decline in hardware prices to buy computers but who find the software complex and difficult to get to grips with.
An annual 540 subscription

An annual \$40 subscription to the group buys access to its five day a week telephone advisory service, use of the One-to-One electronic mailbox service and a quarterly magazine of useful tips and reviews of developments in the microcomputer market.

The group is supported by the retail chain W. H. Smith, which can arrange membership through 150 of its major stores. Details from Jane Davis at the Small Business.

Solves. Details from same Davis at the Small Business Support Group, Bank Bulké-ings, Kennel Way, Broadway, Worcestershire, WR12 7DP.

OWNERS and managers of small companies seeking to expand can join Middlesex Polytechnic next month for a training programme funded by the Manpower Services

Commission.

Entitled Action Learning Entitled Action Learning for Managers, the course encourages participants to learn from each other and to develop skills in areas like finance, marketing, or personnel. It is designed for people who have run their businesses by hunch but now need a more professional aronnary.

approach.

The course starts with a weekend session on Sept-ember 13 and 14 and cootinnes with 12 Tuesday eventimes with 12 Tuesday even-ing meetings at the Middle-sex Business School in Hendon. A second programme begins next January. Details from Admissions Enquiries, Middlesex Polytechnic, 114 Chase Side, London N14 5PN.

YORK ENTERPRISE, the city's enterprise agency has launched a £250,000 business development fund for small ventures likely to create or sustain jobs in the area.

Details from Geoffrey Sherwise at York Properties win at York Enterprise Limited, 1, Davygate, York.

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How to assess a market

Martin Posner continues his series on exporting

assess the market for that first overseas order. The previous article in this series showed how critical it is to plan carefully all export marketing policy. Now is the time to examine whether local conditions will permit that policy plan to come off. Let us suppose that the plan is to export to ltaly.

A good start is to look at the

A good start is to look at the detailed statistics of the Ex-ports to Europe branch of the British Overseas Trade Board. Those will show among other things that Britain's exports to Italy were worth £2.5bn in 1985, making it the UK's sixth biggest market.

This information is free to This information is free to and q all businesses. Further sources the beare the country reports issued sales. This libyds economic reports are costs particularly informative — its VAT). 30-page review of Italy covers schem population, politics, economic who growth, average incomes, share wester of projuction and services.

growth, average incomes, share of production and services, banking and finance.

A quick read of the Bankers' Almanac Year Book, which is available in most reference libraries, will show bow many international banks operate from the City of London. The almanac also lists all overseas branches of all major banks. By contacting these banks you can gain an immense amount of trading and economic information, in most cases for

mation, in most cases for nothing.

Reading this general back-ground material will help the first-time exporter to develop a feeling for the target country. A telephone call to the local area BOTB desk officer will produce advice on UK export re-strictions or Italian import re-strictions. It is now possible to start

essessing the market for the product or service to be exported. The BOTB also operates a Market Prospectus Service through which it can contact the 170 British embassional and a service through which it can contact the 170 British embassional accounts the service and sies and consulates abroad to confirm the type of help avail-able from local commercial

Once the budding exporter has given a description of his company and its goods or ser-

THE NEXT step for a business that has decided to explore the possibilities of exporting is to assess the market for that first overseas order. The previous article in this sample, and the exponential sample, and the exponential sample in this sample are the specific enquiries to assess the sample.

A report will normally be provided within 12 weeks, from the first enquiry to the Market Prospects Services. Its first part will cover topics like market conditions, local demand and the strengths and pattern of competition from locally produced and imported goods. This should highlight any obvious pitfalls in the exporter's path. The second part of the re-

The second part of the report is an assessment of the product or service's chances in the existing market. It gives an overview of likely competitiveness in terms of price, delivery and quality. Finally it suggests the best methods of developing sales.

sales.

This market prospect services costs only £175 (including VAT). It is a greatly subsidised scheme available to exporters who wish to develop sales in Western Europe, the US, Canada, Australia, New Zealand. Canada, Anstraits, New Zestand, South Africa, Japan, Brasil, Hong Kong, Malaysia and Singapore. Where an encouraging raport stimulates a visit to the market covered, the BOTB will refund the fee as a contribution towards travel.
Free professional advice is also

available from the board on how to set about market research for exporters or potential exporters

exporters or potential exporters of goods or services produced in the UK. Grants are available through the BOTE's Export Marketting Research Scheme.

The Department of Trade and Industry publishes free advice on selling to 170 different countries entitled Hints to Exporters which are available from the DTI, 1 Victoria Street, London, SWIH OET.

The World Trade Intelligence

London, SWIR CET.

The World Trade Intelligence publishes guides from £19.50 each for exporters considering the following markets: West Germany, Netherlands, France, Italy, Spain and Portugal. A US guide will be published shortly. Details from WTI, 140 Tabernacle Street, London, EC2A 4QJ.

The next article will look at tariff restrictions, exchange contariff restrictions, exchange controls, and payment terms.

Martin Posner is a credit

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APPOINTMENTS

Alex. Stenhouse creates new division

ALEXANDER STENHOUSE as formed an aviation and serolace division. The new divion has been specically created in the excitative purpose of proliding London marketing serlocing London marketing services activities. He has also been appointed company for the group's services activities. He has also been appointed company secrelexander & Alexander Inc and lexander for any of WPP group. Mr Stocks, who has been buyer lexander & Alexander Inc and lear of WPP from DRI Holdings where he was corporate finance in the smaller function of the confederations, the wholly-owned subsidiary of WPP group's services activities. He has also been appointed company secretary.

Mr Stocks to the board.

Mr Pulman who joined I. G.
Lintels Mr Wayne director and company secretary.

Mr Pulman who joined I. G.
Lintels in August 1985 as financial with the company for four years, lintels in August 1985 in financial rectors are Mr A. M. Rison.

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Mr T. R. Usher has been director and company secretary.

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Mr D. R. L. C. LINTELS Mr Wayne director and company direct ALEXANDER STENHOUSE as formed an aviation and neroace division. The new divion has been specically created
in the exclusive purpose of proding London marketing serices for the US and Canadian
stall aviation operations of
lexander & Alexander Inc and
eed Stenhouse, as well as for
sternational space and satellite
lents. Appointed as divisional
irectors are Mr A. M. Rison,
r D. J. Woods, Mr K. A. Webb
id Mr K. H. Coembs.

PPF INTERNATIONAL has

r D. J. Woods, Mr R. A. Webb
ld Mr K. H. Coembs.

At STEEL BURRILL JONES
r J. C. W. Wright has been pointed a director.

Dr Tony Dawson has joined CLUGSTON CONSTRUCTION as deputy managing director/technical director with particular responsibility for marketing, estimating and technical services.

Mr Robert Miller has been

Mr T. R. Usher has been appointed a director of PHOENI-CIAN HOLDINGS of Vancouver, BC. He is currently executive chairman of its UK subsidiary, CHANCELLOR INSURANCE CO. Mr F. P. Mannix and Major-General N. St G. Cribben have been appointed directors of Chancellor Insurance Co

At I. G. LINTELLS Mr wayne Palman has become a financial director and company secretary. Mr Pulman who joined I. G. Lintels in August 1985 as financial manager and company secretary will now be in overall control of the company's financial affairs.

Mr Stephen Finch has been made a director and deputy chairman of NOBLE & LUND. He was previously deputy chairman of Weir Group and a director of Suter.

presented Mr Peter Midwood as appointed to the board of directors and of its overseas division. The succeeds Mr Reith L. Smart as director of finance. Mr Millar best directors of H. J. Heinz Company.

He succeeds Mr Reith L. Smart as director of finance. Mr Millar best director of finance as financial converse a director of finance. Mr Millar best director of finance. Mr Millar best director and Mr Peter Berbert as marketing director. Mr Snell as an extensive back. FIELD LAWRENCE.

FIELD

ONTRACTS

£15m radar order for Marconi

ARCONI RADAR SYSTEMS joint bays and ancillary apperature total project costs and between nine and 18 months in elapsed orth nearly £15m by the Royal *

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In a contract worth £830,000 Barclays Bank has bought the BIS FUNDMASTER 38 investment management system from
MIS APPLIED SYSTEMS, part
of the BIS (Business Intelligence Services) computer
services group. BIS FUNDMASTER 38 is the IBM System
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supply the Government of Hong Kong with cabling and switchgear for its 35,000 houses per year low cost housing programme and the construction of the new Tsuen

Muen Hospital. Goring Gap in Berkshire.

ICC installed the first circuit are in 1986-87. The cable and present management system are manufactured by BSCL's designed to satisfy present and installed by Balfour Killing and merchant banks, part of Balfour Beatty a member of the BIOC Group).

See Most of the cable route to see a golf course where, to rosses a golf course where, to restain restrictions will be branch in Old Broad Street, part of the siting of can save about 40 per cent of digital network, using multi
MASTER 38 is the IBM System as the IBM System of BIS FUNDBELLING LEE INTEC has won of the Forties Beho platform. BELLING LEE INTEC has won of the Forties Beho platform of the South East Forties orders worth around £1.9n. It has, in conjunction with its agency in Norway, S.A. Svendsen, secured a contract for the supply of fibre optic digital and analogue project team, Press will provide supervision, skilled labour and the next five years, to the Norwagian Defence Communications process systems, life-support systems and utilities after installation of the jacket and topsides from once the initial systems are installed. The systems will form part of the Norwegian Defence Communications process for an offshore start digital network, using multi-

and electrical. Si

plexers and modems made by Belling Lee Intec, a member of the Cambridge Electronic Group

of companies.

The first phase of a contract, valued at £200,000, has been secured to supply EMP suppression systems and RF screened sion systems and RF screened doors to Portugal, through its agent, Centrel. A result of the increase in the use of high technology solid state devices in motor vehicles is a joint venture by Belling Lee Intec with Emerson & Cuming Europe for the construction of a welded steel EMC suppression chamber at the Motor Industry Research Association. This will be complete with microwave anechoic materials and full mechanical materials and full mechanical and electrical services. The total project value will be around £500,000.

A contract worth around 23m has been awarded to FRESS OFFSHORE by BP Petroleum Development for hook-up work on the Forties Echo platform.

Liberty Life Association of Africa Limited

Interim report for the six months ended 30 June 1986

		30	tu central jenn uptrad)	Year order 31 Decrease (author)		
	Nae	ree.	1985 Ren	dues:	1985	
Net premium income Net income from investments and		438,9	338,1	+27,4	686,9	
andry income		217,9	167,6	+30,0	377,2	
Total income		648,8	505,7	+28,3	1 064,1	
Net taxed surples Preference dividends	1 2	35,6 (3,7)	26.4 (2.7)	+34,8 +37,0	64,1 (6,5)	
Net taxed surplus attributable to ordinary and preferred ordinary diareholders		31,9	23,7	+34,6	57,6	
Number of ordinary and preferred ordinary shares on which net taxed surplus per share is based (1008)		15 680	13 958	+12.3	14 183	
Nel taxed purplus per share (cents)	162	203,2	170,0	+19,5	406,4	
Dividends per ordinary share (cents) - Interim (declared 21 August 1986) - Final (declared 12 March 1986)	3	158,9	125,0	+20,0	125,0 175,0	
fotal dividends per ordinary stare (cents)		150,0	125,0	+20,0	300,0	
Dividend per preferred ordinary faire (cests) - Interim (declared 21 August 1986)		110,14		_		
SUMMARISED GROUP BALANCE SH	æ		30 june 1986 milioù . (s	30june 3 1985	1 December 1985 Seedlech	

- Estimulariament i undert a tent		,,,,	:	
SUMMARISED GROUP BALANCE SHEET		<u></u>		
		36 june		31 December
		1986	1985 Expendical	1985 (sugleçi)
	Nate		Ret	San Contraction Co
Interests of				
- shareholders of Liberty Life	2	1 262,7	713,3	908,6
- minority shareholders		1 353,3	447,8	912,5
Total capital and reserves employed		2.596,0	1 161.1	1 821,1
Long-term liabilities		709,9	187.7	574,3
Life funds	1	4512.4	3 526,5	3931,7
		7818,3	4 875,3	6 3 2 7, 1
Represented by				
lavestments		7929.8	4795.4	6249.0
Freed assets		29,3	23.4	29,9
Carrent assets		465,2	356,2	389,4
Yotal assets		8414,5	5 175,0	6668,3
Current Sabilities		596,2	299,7	341,2
		7818,3	4875,3	6327,1

1. Les setroques appearants
Due to the general impacticability of undertaking full actualists valuations other than at the end of the Brancial year, no valuations of the file funds of Liberty Life and its subsidiary, Charter Life Instance Company Limited, are conducted at the ball-year stage, for the purpose of this interior report and following the company's established practice, the set transf supulse has been included on the basis of an estimate which results in the net transf surplus per share being shown at half the local architect for the conductors full financial sour model 31 December 1965.

2.2 The issued share capital of the company following the rights offer relented to in 2.1 is consensity as follows:

presently as follows:

14837 614 ordinary shares of R1 each;

2467 804 preferred ordinary shares of R1 each;

2467 804 preferred ordinary shares of R1 each;

1594 424 convertible resteemable connotative preference shares (Series A, B, C, D, E and R) of R1 each which are convertible (or redeemable) at the option of the holdes on varying terms and clases into an equivalent sumbar of ordinary shares in the company on the last day of September in the years 1986 to 1991.

A maximum of 192 314 of these convertible preference shares are convertible into ordinary shares on 30 September 1986. 18 919 842 Total number of ordinary, prei

TransAtlantic Insurance Holdings pic ("TransAtlantic")
In May 1986 TransAtlantic raised £137,5 million by way of a rights offer of 50 million
preferred ondrany dares issued at 275 per share. In order to broaden its shareholder base
and to resoluce TransAtlantic's edependence from the need for any financial support from
its South Atlean parent company. Libriry, Life placed the major portion of its rights
exhibitement in terms of the rights offer with a wide spread of United Kingdom institutional
and other invaries.

and other investors.

During July 1986 following an offer by TransAtlands for the balance of the ordinary phases and preferred mock which it did not already own in The Continental and Industrial Trust place Continental Trust places are the balding in Continental from 25% at 31 December 1985 to 88,7% at 23 July 1986. As part of the offer, TransAtlands: issued an additional 4 315 222 new preferred ordinary there at 275 pp of the area or more shareholders in Continental Sian alternative to the cash offer which, taking into account the 30 million preferred ordinary shares issued in the cash offer which, taking into account the 30 million preferred ordinary shares issued in berne of the rights offer retirend to in the previous praggagh, resulted in Liberty Life's insees in TransAtlants, being reduced from 75% at 31 December 1985 to approximately 8745 at 28 July 1986.

Limited.

In order to facilitate the participation of URS, an intermediate company was established as subsidiary of Liberty Life, held as to 67% by Liberty Life and 33% by LRS. The attributable equity retreats of the standardeders of Charter Life are effectively held as to approximate 41% by Lifery Life, 39% by Casardian National and ZRS, by LRS. The results of Chart Life have been ancluded in Liberty Life's income statement for the six mostlys ended 30 Jun.

Declaration of interim ordinary dividend and preferred ordinary dividend in respect of the year ending 31 December 1986

Nosice is hereby given that interim ordinary dividend No. 37 of 150 cents pur share and public ordinary dividend No. 1 of 110,14 cents per share have been declared in respect of the year on 31 December 1986, payable to shareholders registered in the books of the company at the clobusiness on Friday, 5 September 1986.

egues in respect of dividends usued by the United Kingdom transfer recretaries will be drawn in shall Kingdom currency tempolent on 25 September 1986. Non-resident shareholders' tax at the eo il 15% will be deducted him dividends where applications.

D. Gerden (Chairman) H. P. de Villiam (Deputy Chairman) M. Winterton (Executive Disoche)

Businesses for Sale

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The Joint Receivers offer for sale the business and assets of a well established industry leader in the manufacture and installation of melting plant for foundries and pollution control equipment.

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For further information please contact:

Mr. A. W. Brierley. Arthur Andersen & Co., St Paul's House, Leeds LS1 2PJ. Telephone: 0532 438222. Telex: 556472 AALEED G.



For Sale by the Receiver and Manager The Business and Assets of **Kirk Holdings Limited BB Kirk (Constructions) Limited** Kirk Developments Limited (in Receivership)

building and civil engineering contractors Turnover approximately £9.2m per annum

- Approximately 170 skilled and semi skilled employees Extensive freehold offices, workshop and yard situated in Skipton, North Yorkshire
- Building and civil engineering contracts nationwide
- Property portfolio which includes a fully let development valued at approximately £0.5m
- General contractors equipment including piling plant Further details are available from the Receiver and Manager, Ralph S Preece, FCA,

△ Touche Ross

11 Albion Street, Leeds LS1 5PJ. Telephone: 0532 444741. Telex: 556376 TRLEED G

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ace is available at current pre

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dited accounts—£500,000 profit ous inquiries from principle

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and pleasant walled gardenniess
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Pursiant to the notice published on 27th June, 1986 membe that the rate of exchange at which payments of the above be despatched by the United Kingdom Paying Agents on 4th is 1 Rand of 100 cents equals 25.691433p United Kingdom strops deviced payable by the United Kingdom Paying Age equivalent to 256.91436. Holders of share warrants to bear that payment of Dividend No. 102 will be made on or after 1956 soon surrender of Coupon No. 103 at the London 1911 Sangel & Company Limited, 45, Beach Street, London 1911 Sangel & Company Limited, 45, Beach Street, London

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Equivalent in United Kingdom currency of dividend declared Lessi South African Non-Resident Shareholders' Tax of 15% AMOUNT PAYABLE WHERE A U.K. INLAND REVENUE DECLARATION IS LODGED WITH COUPONS Less United Kingdom Income Tex at 14% on the gross dividend (See notes 1 and 2 below)

MOUNT PAYABLE WHERE COUPONS ARE LODGED WITHOUT UNITED KINGDOM INLAND REVENUE DECLARATIONS

The Gross arrount of the dividend for use for United Kingdom and The Gross arrount of the dividend for use for United Kingdom and Suriax purposes is 256,9145p.

Under the Dooble Taxazion Agreement between the United Kingdom and the Republic of South Africa. South African Non-Resident Shareholders Tax applicable to the dividend is allowable as a creant spained the United State of the Control of the Control of the Control of the Control of the Polycon of the Control of

Compose must be listed on forms obtainable from the London Searce Citics and deposited for examination on any week-day (Saturday excepted) at least seem clear days before payment is required.

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BARNATO BROTHERS LTD. London Secretaries Mrs. A. Smith Secretary

, i 1 , p. 15

1.

TECHNOLOGY



Peter Bruce in Bonn tracks the progress of Westphalia Separators, a leading separator maker

Where robots now stalk the factory floor

dous to walk about the main machining shop at Westphalia Separator's sprawling works in Oelde, a small town just north of the Dortmund-Hanover autobahn. For about two years now the floor has been the preserve of two brooding, computer-con-trolled, workpiece transporters and they are not programmed to avoid visitors.

founded in the town in 1893, is the world's second biggest producer of high speed centrifugal separators—along with the industry leader, Sweden's Alfa Laval, it commands more than half of a market estimated to be worth roughly DM 1.8bn (US\$864m) a year. Its ubiquitous product, or ones like it, forms the core of any operation requiring the separation of two fluids or fluids from solids to produce anything from cream and cheese to coffee extract, oil from shale and antibiotics.

In some ways, Wolfgang Habig, chairman and now a senior member of the family which has owned Westphalia Separator since 1915, belies the apparent quiet of the industry he works in. Witty, a voluble follower of the international Press, he seems to do nothing slowly. That partly explains why his main shop floor is no longer safe to walk on. His grandfather, Werner

longer safe to walk on.

His grandfather, Werner Habig, first came across the pletely automated.

The result was that Westyoung banker and was so con-vinced he could make money out of it he bought it. The pre-vious owners had been distracted by other technologies and at one stage produced The

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Westphalia, a car.
Wolfgang Habig has been chairman since 1976. By that time the boom in the separator market had happened—up until the war the market had been almost entirely dairy-based but

earned in non-dairy markets.
Ten years ago though, the company was confronting a well served, though not quite satura-

ted international separator market and wondering how to maintain balance sheet strength while the growth of sales slowed. The answer then, as it appears to remain, was to invest money in production and hope the overheads would fall. There are about 1,000 machine tools in the Oeide plant, nearly 150 computer controlled, and most of which with an average age of less than 10 years. In the early 1980s the com-

pany decided to bu ytwo large horizontal machining centres from a Swiss machine tools producer, Dixi, to do the main machining on the 40 or so different cast iron drive hous-ings for its seperators. These housings weigh u pto 800 kg. At about the same time though senior company engineers were visiting major machin tool ex-hibitions in Tokyo, Chicago and Paris and the realisation gradually dawned on them that the job they had in mind for the machining centres could be com-

phalia Separator, in August 1984, commissioned in its machine shop one of the few authentic flexible manufacturing systems (FMS) in the country outlet of the motor industry. Where five or circumstry industry. Where, five or six years ago the daily stock of machined housings in-house would average around 350, each worth around DM 9,000, today there are hardly any. there are hardly any. lost in the maze of stand-alone
The system requires super- machine tools that still domin-

after 1945 the chemicals indus-vision by a foreman for about tries in Europe and the US 30 minutes at the start of each began to make huge demands on separator producers. Separator technology and to adapt itself to very large capacities and to automation. Today about 60 per cent of Westphalia's revenue is earned in non-dairy markets.

Ten years ago though, the guarantee them the accuracy propulsed and the save promised, and, he says, delivered, by the Swiss machine

tool maker.

Controlled by a Nixdorf central computer, a supervisory DEC computer organises the actual operating sequence within the system. There are Allen Bradley supplied numerical controllers on the machines them-

The two Schindler Digitron automated guided vehicles (AGVs) colect housings from a neighbouring high level ware-house. When a machining centre becomes free, they deliver the waiting housing. Machining time varies between 80 anr 120 minutes per housing, Machining time varies between 60 and 120 minutes per housing. depending on how big it is. But another advantage for the comanother advantage for the com-pany is that the cost of machining on the system is constant, regardless of the size of the part or batch. Wolfgang Habig is very casual about all this. "It is nothing extraordinary," he says, "there was a risk it would not work bus it was not so great

work but it was not so great. The machine tools would have been usable anyway." Because the company paid for the installation itself, it never really got around to doing a detailed cost justification.

The DM 6.2m Westphalia FMS substituted only 10 or so jobs out of a total workforce of 2,600 and the whirring robot cars moving between storage and machine tool area easily



Cheese is just one dairy product which relies upon the separator for its manufacture

core piece in any separator.

He has little option. Firstly, he suspects that his competitors have probably not done as much

automating as he has and will soon begin to try and catch up. Secondly, sales growth is now so slow that cost manage-

ment has assumed a gargan-tuan importance in the com-

pany's strategies. Turnover between 1980 and 1985 rose

by just 18 per cent to DM 400m. (Many West German company

ate the shop floors. Neither has do is stop investing," says Mr the system led to any real increase in production, "That was not the reason we bought tt," he says. Having been to the machine tool shows and "sized up the variables you are led to one decision — FMS." Also, not all the inventory problems have been solved.

Custom building means the company has to stock up with many key parts well in advance of potential orders. And where production costs in the area worked by the FMS have fallen 30 per cent over two shifts, the potential delivery time gains made in drive housing machining are often skewered by other, unautomated, parts of the manufacturing operation.

None of this may sound very

bought the FMS. Just as the system was approaching com-missioning, the European Com-munity farm ministers agreed to impose strict quotas on the production of milk in the EEC, a decision that devastated Westphalia Separator's core market
The company's sales in the
European dairy industry fell by
half, says Mr Habig, and
another important Westphalia
Separator product milking

Separator product, milking equipment, was also badly hit.

In the US, too, milk quotas are in force and the market, the world's biggest, is difficult.
"The farmers there are in a bad way and the first thing they

chiefs weep if they fail to do that every 12 months) and net profits for last year totalled DM 12.4m. Habig.

If the intervention of politics

had not been enough to con-vince Westphalia Separator Although the FMS has aiready paid for itself, Mr Habig is also adamant that it be used to the full and the company has begun to examine ways of management that they had been right to invest in a (potential) cost cutter like FMS then the radioactive fallout from the doing more with the machines in a third shift when the system is not being used. Automation, Soviet nuclear reactor at Chernobyl earlier this year probably did the trick. German farmers in particular found themselves he argues with some passion, can be made a nensense when it is switched off so that people unable to sell milk to a worried it is switched off so that people can go home or on holiday.

Use of the Oelde FMS will probably be subcontracted out when it is not in use by Westphalia. "We are not only selling machine time." says Mr. Habig, "we are offering precision as well."

• Previous articles in this series: public and have since had to be bailed out of financial trouble by the Government in Bonn. Orders for milking and separation equipment were immediately hit and are only just

beginning to recover.

In the face of all this, Mr
Habig has become even more
convinced of the need to auto-May 28: Swatch, Swiss another DM 3m on an auto-mated high-stacking system. June 3: Hoover, British due to be completed by the end of this year, to store bowls, the nestic appliance manufac-

> June 17: VEGE Motoren, Dutch remanufacturer of car July 8: Bellot: French flour July 15: Electrolux, US

cleaner manufac-

July 30: BUSM, British manufacturer of machine tools for the shoe industry. August 13: Benetton, Italian clothing producer.

Measuring finishes

PLASTICS and surfaces machined to mirror finishes may not be as smooth as they seem. So Hahn and Kelb has developed an optical sensor which can measure surface roughness without contact which is particularly applicable to delicate materials. In optical sensing, a heam of interest light is streeted of infrared light is directed at the surface being checked. The beam is scattered according to the irregularities in the

Hahn and Kelb's UK com-pany on 9788 74261 says that the instrument has applications on the production line.

Image processing

THAGE processing becomes markedly cheaper with a UK-developed system from Data Harvest of Bedford, which is making and selling a system for industrial, security,

for industrial, security, scientific and other fields that costs only £395.

Called FrameStore, the system can sequire and analyse TV pictures from a variety of sources by digitizing one frame into random access memory and then recognising 64 levels of intensity in each of 192 x 256 picture elements.

ture elements. One digitised and stored the data can be manipulated in various ways to suit the application. More on 6525 application. 373666.

Office planning

INTERGRAPH, one of the leading specialist makers of computer aided engineering, computer added engineering, design and manufacturing systems has launched some software for plauning the layout of an office of production facility. The software makes use of tlatabase technology. It has two databases—one for catalogues and the

nology. It has two databases

one for catalogues and the
other for projects.

Catalogue databases define
farniture, fixtures and equipment items and grouping of
items that might form part
of a design while the project database contains information on space allocations, occupants and everything which has been placed in layout drawings.

Monitoring moving components

PANDROL International has immehed a system which can measure the movement bemeasure the movement be-tween neighbouring com-ponents. This has already been used in the railway in-dustry to study the movement of the rail relative to the support sleeper which can indicate any likely banks in the railway line as vehicles travel over it.

The dichroic displacement measuring instrument, which was developed by Cambridge Consultants for Pandroi Inter-sational, has a wide range of applications where two com-ponents move relative to one another. More information from Pandrel in London on 01-834 2255.

Hunting for particles

THE PRESENCE of par-THE PRESENCE of particles in fluids can cause damage to plant and machinery. Monitoring the amount of such particles in lubrication oil, for example can indicate that a machine will need repair or maintenance. Cormon based at Lancing in East Sussex is now marketing a wear monitoring instrument developed by Fulinstrument developed by Ful-mer Research Laboratories based on this principle.

IBM PC acts as a telephone

PHONE TERMINALS are created from the IBM personal computer (PC) or a compatible model by plugging in a circuit board from Thora Eriesson Telecommunica-tions, Horsham, UK (9403 64166).

The PC becomes an inte-grated workstation for voice and data, for use with the Thorn Ericsson MD 110 voice/ data PABX (company tele-phone exchange). Users con-tinue to use their PCs as be-fore but in addition can comfore, but in addition can communicate data to other users either in or out ofthe building. The board sets the appripriate data rates automatically.

Japanese economy will grow 2.4% in fiscal year 1986

In 1986, the U.S. economy is expected to grow 2.5 per cent in real terms. Buoyed by declining oil prices, lower interest rates and a weaker dollar, U.S. business activity will advance moderately this autumn. Due to the huge surplus in Japan's current account balance, the yen will remain strong during the year. The yen will remain around ¥160 to the U.S. dollar in fiscal 1986. As for crude oil prices, Japan will import crude od at about \$16 per barrel in the fiscal year.

The domestic economy will remain stagnant for the time being. Meanwhile, the soaring yen and cheaper oil will wipe out inflationary expectations. Therefore, Japan's monetary policy is expected to be

Outlook for fiscal 1986

Japan's real economic growth will stand at 2.4 per cent in fiscal 1986, substantially lower than the level in fiscal 1985 and the lowest since fiscal 1974 when a negative growth was recorded. The nominal growth rate will

be 3 9 per cent, the lowest since fiscal 1951 when Japan started

compiling GNP statistics. In addition to the deflationary effects of the strong yen, low inflation brought about by the yen's rise and lower oil prices is responsible for the slow nominal growth. Wholesale prices, in particular, will fall 9.6 per cent in liscal 1986 showing signs of deeper disinflation.
Taking a look at the business cycle, both the nominal and the real growth rates in the first half of fiscal 1986 will be lower than in the second half of fiscal

1965. Corporate earnings in the first half will also be lower than in the preceding half. These forecasts are based on the view that the strong yen's deflationary impact on the economy will reach a peak during the However, in the second half

of fiscal 1986, the benefits of the rising yen and cheaper oil will be gradually passed on to the London Branch: 4th & 5th Floors, P&O Bidg., Leadenhall Street, London EC3V 4PA, England

Outlook for each demand segment Personal consumption will

increase 3.0 per cent in real terms, higher than the 2.7 per cent for fiscal 1985. Although nominal personal income growth will slow down due to low pay hikes and less overtime work, real personal income will show a higher growth rate, helped by price stabilization.

Private housing invest-ment is expected to increase 4.9 per cent in real terms, higher than in fiscal 1985. Housing starts will be promoted by lower materials cuts and softer bousing loans.

Private capital invest-ment will not lose upward momentum, but its project-ed real growth of 5.3 per cent will be far below the rate in fiscal 1985. Behind the slower growth are declining exports in the manufacturing sector. This sector will refrain from building up its facilities, reflecting lower capacity utilization and declining earnings.
On the other hand, capital in-

vestment by the non-manufac-turing sector will continue to be active; power utility and gas companies are scheduled to boost their capital investment sharply in line with the Government's stimulative policy. Other non-manufacturing businesses will also step up spending, due to larger earnings

turing concerns will increase research and development investment amid intensified com-Public demand will expand 9.0 per cent in real terms, accounting for 1.5 percentage points of the 2.4 per cent real

growth rate in fiscal 1986. The 1.5 point contribution will be the highest since fiscal 1978 when an expansionary fiscal policy was adopted.

In response to the call for stimulation of domestic de-mand, public demand will be

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causing brighter signs of increased by active utilization recovery. of the Government's investment and loans program and local governments' public

Works projects. An expected sharp fall in the deflator and the issuance of gold coins commemorating the 60th anniversary of the Emperor's reign will be other positive factors raising govern-

The current account sur-plus will post a sharp decrease of 44.9 per cent, a negapoint contribution from a minus 0.2 point contribution in fiscal With their off-year elections 1985). The downturn will be attributable to a fall in external demand (to minus 1.9 points from plus 0.7 point) and a slowdown in private demand (to plus 2.7 points from plus 3.7

Nevertheless, Japan will at-tain domestic demand-led expansion in fiscal 1986 for the first time since fiscal 1978.

Balance of payments Japan's current account bal-

ance will register an enormous surplus of \$80 billion in fiscal 1986, as compared with a \$55 billion surplus in fiscal 1985. This historically large surplus will be caused by not only the expanding merchandise trade surplus but also the decreasing invisible trade deficit.

The strong yen will slow down the growth of export volume, but the value of dollarbased exports will rise because

approaching, the U.S. is expected to step up criticism of the Japanese surplus. It seems unlikely that the strong yen alone will mitigate Japan's external economic friction In short, it is essential that

Japan boost imports by opening its markets further to foreign goods and expanding domestic demand.

Despite the deflationary impact of the yen's upsurge, the Japanese economy retains signs of strength mainly due to the accelerated implementation of public works projects in the first half of fiscal 1986.

In the second half, private demand will pick up somewhat, but Government spending will lose momentum in reaction to the early implementation of public works projects. There is a possibility that the Govern-ment's fiscal expenditures will

In addition, within the frame-

Outlook for Japanese Economy in FY1986

	LAISET						
			1st belf	2=0 half	-	Tel field	2ml half
Manipul gross sational expenditures	+6.7	+6.9	+5.7	+5.0	+39	433	+4.4
Real gross national expenditures ,	+5.0	+4.2	+4.0	+3.0	+2.4	+1.7	+3.5
Domeetic demand	+3.5 (3.7)	+3.5 (3.5)	+3.3	+4.1	+4.4 (4.2)	+4.8	+4.4
Private domestic demand	+4.6 (3.6)	+4.7 (3.7)	+5.0	+4.8	+35 (2.7)	+2.6	44.5
Final consumption	+25	+2.7	+2.7	+2.5	+3.0	+3.2	+3.3
Housing investment	+0.4	+37	+3.3	+4.4	+4.9	+4.7	+53
Corporate capital investment	+10.9	+12.6	415.1	+8.2	+5.3	+3.2	+6.3
Investory incresse.	+86.0	-10.9	-35.5	+2.5	-17.5	-51.7	+81.7
Public degrand	+9.6 (0.1)	-1.4 (-0.2)	-4.7	44.6	+8.0 (1.5)	+14.5	+3.8
Government final communities	+2.3	-1.4	+23	+3.3	+5.6	+3.0	+13.3
Fixed pupital formation	-30	+2.6	-14.0	+6.4	+13.6	+18.0	+18.2
Net exports	+49.2 (1.3)	-6.9	+19.5	-19.5	-44.9 (-1.9)	-60.2	-26.7
Exports, etc.	+15.8	+18.9 (0.7)	44.0	-8.6	42	-4.3	-82
lasports, etc	+10-0	+2.2	+0.0	-85	+4.5	+15.1	-27
Weing and manufacturing production	+9.5	-1.7	+4.0	-13	+0.4	+1.7	+0.3
Prices		+35					
Wisplacete prides	+0.2	-29	-0.7	-5.0	-9.5	-10.6	-44
Consumer prices	+22	41.3	+2.1	+1.7	+0.4	+0.5	+0.3
Intersectional balance of payments (5 tdl.)				_			
Correct account belance	37.0	55.0	26.4	28.7	20.5	43.7	37.1
Trade belence	43.6	61.6	23.3	32.3	84.4	45.5	39.1
Exports	197.9	180.7	86.7	94.0	203.5	104.1	86.4
Imports	122.3	191.3	57.4	61.6	119.1	54.5	60.3
(mespitale trade telesco	17.1	14.7	122	12.6	11.6	79.6	11.0
Transfer payments	Ť1.5	11.8	10.7	11.2	12.0	T1.0	11.0

tive factor hindering the over-

Exports will drop 6.2 per cent mainly due to the yen's rapid ascent. The weak U.S. economy and China's import restrictions will also be responsible for the export slowdown. On the other hand, imports will grow 4.8 per cent since the yen's rise will oush down the price of imported manufactured goods and the issuance of the Emperor's commemorative gold coins will

As a result, Japan's economy will be unable to avoid a sharp downturn in fiscal 1986 despite the help from increasing public demand (up to a positive 1.5 of the so-called J-curve effect. Although the mighty yen will help increase import volume, the value of dollar-based imports will be unchanged as a fall in oil prices will make oil imports cheaper.

The projected fall in the invisible trade deficit will be brought about by larger overseas assets, which will increase interest and dividend incomes. Issues to be tackled

Despite the yea's sharp rise, the current account surplus will expand further in fiscal 1986.

work of the austerity budget policy, there will be limits on the use of effective fiscal policy. Therefore, stimulating private demand would be a key to sustained economic growth. Specifically, it will be necessary to pass on the benefits of the yea's rise and cheaper oil to the domestic economy as soon as possible and also to promote the demand-expansion mea-Mayekawa report prepared by Prime Minister Yasuhiro

Talk it over with DKB. The international bank that listens.



The next DKB mouthly report will appear Sept. 25.

Sun and wind power join forces THE FIRST use of combined tributed around the network, provide extra power that may wind and sun power to heat The central control building be needed.

ted last Friday at the opening of the Energy World exhibition at Milton Keynes.

It was one of more than 50 energy efficient homes which are on show over the next months and is probably the most unusual in terms of power gen-

Each house will have a bank of monitored solar arrays set into the conser- University.

homes in Britain was demonstra- also has a 27 square feet array The combined system not

at the Milton Keynes Energy Park. Total output of the two systems is 30kW.

Both wind and sun power on

their own tend to fluctuate in At present only one house is powered by the combined system though nine houses are eventually planned for the site. Each house will have a bank of solar arrays set into the conser-

vatory roofs. The output of the arrays goes to a central control tains 5 tonnes of back-up Powernet building where the power is dis-batteries to store electricity to controls.

on its roof.

The wind generator also links the wind generator also links the sting, lighting and cooking into this control grid. It has 30 but also powers a small foun-feet diameter blades and is taln in the complex.

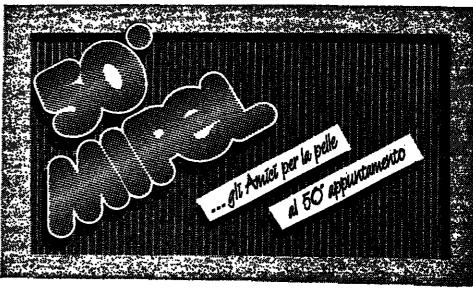
been funded 40 per cent by the Energy Directorate of the European Community and the Department of Trade and Industry in the UK has also promised to contribute to the

Solapak, one of the leading electricity companies in the UK has built the arrays while IRD, part of the NEL group, has built the wind generator and Powernetics has provided the

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Art/William Packer

Private Goya and Russian treasure in Lugano

Great art never disappoints, though we may have driven half way across Europe to put it to the test. This summer, for example, in Lugano, which sits with such picturesque convenience upon its lake beside one of Europe's arterial autoroutes, are two exhibitions of most beautiful and extraordinary things which, taken item by item, few of us could ever hope to see again.

For again this year Percent

For again this year Baron For again this year Baron Thyssen - Bornemisza has continued his policy of complementing his own generosity, by which significant portions of his own collections seem to be forever on tour abroad, by drawing back to Lugano in return special exhibitions and displays which perhaps only he could have requested and achieved.

So it is that the suite of So it is that the suite of private rooms at the Villa Favorita, converted temporarily into galleries — which last year held major paintings from Hungarian collections—is filled (until November 2) with an historic display of European gold and silver work of all kinds, plate, jewellery, furniture and assorted objets d'art from the collections of the from the collections of the Hermitage in Leningrad None of it has been shown in the West before and much of it has hardly been seen in Russia except by scholars, for the Hermitage is so fabulously rich in its reserves.

What the Hermitage holds in the treasure it confiscated from the Russian nobility at the Revolution, is not merely com-prehensive but definitive. Here we can be given only the barest indication of its range and depth and yet one so choice and rare, taking us as it does from the exquisite furnishings of Russian Orthodory of the 17th century to Faberge, by way of the greatest craftsmen of

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"The Countess of Chinchon," Goya (1800)

Europe in the centuries between. But the other exhibition is no less remarkable. Of all great

artists, Goya is the most modern of the old masters, the most personal and accessible, never more so than in a time such as more so than in a time such as now, when we are so particularly concerned with the expressionist virtues of directness of statement, immediacy of touch and, behind it all, the almost palpable presence of the artists himself. And 'yet it would be a mistake to try to lift him out of the context of his him out of the context of his own time, which formed and conditioned him.

Proto-modern as he was, he Proto-modern as he was, he too was looking to the past for his example, to no one more than to Velasquez—and where then does the modern begin, or tradition end? It is the quality of transition which gives the work of a true artist its peculiar identity, as it were its temporal fingerprint which no temporal fingerprint, which no other can quite share, for shifts of influence, personal adjust-ment and development and the simple passage of time can affect no one slike.

The further rooms of the Gallery proper at the Villa Favorita have been given over (until October 15) to an exhibitions of the control of the bitions of works by Goya in private collections in Spain, many of them still in the possession of the families whose forebears first acquired or comforebears first acquired or com-missioned them. Some have never been shown publicly before, nor even left the house. This being so, the importance of the exhibition, and its quality, are greater than its actual volume might suggest. Only something over 40 paint-ings are shown core of them very small, yet together they span his full career and the several aspects of his ocurre, a blue and the decorative panels, the por-traits, both intimate and official, ravishing.

the religious composition, the children playing, and the darker, more ambiguous imagery of satanism and witch-craft, which preoccupied him in crast, which preoccupied min in his middle years and was given its fullest, most potent expres-sion in the great black paint-ings in the Prado.

But it is not to Goya the fantasist, nor even to the painter of the religious icon or the public figure or the royal personage that we look for the truet most most account. truest, most poignant sense of his creative identity. He was of course, as we see here in his twin portraits of the delicious Countess of Fernan Nunez and her romantically handsome husband, a master of the grand full length. But rather it is the painter of the human likeness in its immediate intimate presence who is the most direct and accessible to us, and the most truly modern.

No matter that it may be No matter that it may be full-length and large or small and close. faced by a sitter whom he respected or perhaps knew well as a friend, or doted upon, Goya produced some of the most profoundly humane studies of the human character and condition ever made. His friend Leandro Fernandez fives us forever with his calm stare, half turning above the high collar of his buff coat, the paint nothing but greys and pinks and browns laid on with, it seems, the lightest of feathers. It is a small work, almost modest, and

yet of the greatest art.
A year or so later, in 1800, he gives us the most touching and intimate of grand portraits, the seated full length of one of his favourite models, Maria Teresa, the young Countess of Chinchon. The space she sits in is no more than shadow, she is white leads with blue with in white laced with blue, with a blue and white bonnet to set off her yellow hair. It is quite

Blood Wedding, Hamlet, Medea/Edinburgh

Martin Hoyle

The trouble with international theatre seasons is that one man's ham can prove caviare to the general. An introductory note to this year's Edinburgh World Theatre Festival makes the Choral Symphony's sentiments on universal brotherhood sound positively misanthropic. But far from underlying the unity of from underlining the unity of the human race, the interna-tional selection emphasises how incommunicable certain values are from one culture to another. This was illustrated by the Teatro de la Plaza's production of Lorca's Blood Wedding. The almost inanely pretty blue and gold of the Lyceum made an odd setting for this story of a

bloody destiny, as hard as sun-baked rock, unfolding its curse. The set by Manfred Dittrich comprises three sides, plus lid, of a plain box, in unevenly applied brown wash. The back wall rises to reveal a sky of higher postered blue and two picture postcard blue and two curved breast-like hills. The austere stylisation is only partly echoed by the production of Jose Luis Gomez. To a non-spaniard there are snatches of Maeterlinck Féerie shot through with Iberian harshness, with a sideways glance at Expression-

ism.

The naturalistic byplay of girls in print frocks and men in their Sunday suits jars with the figure of Death, a hooded beggar-woman whose face is never seen, and the personification of the moon as a bald, naked young woman who strolls prosaically (and verbosely) on while a vast yellow orb rises over the stage, like a shop-

window mannequin they have forgotten to dress.

An oddly-placed interval and the lowering of the curtain for noisy scene-changes defeated the purpose of the spare, uni-versal vision attempted, and summed up the director's uneasy mixture of classical restraint and florid theatricality. The almost constant presence of the villagers fulfils the function of a Greek chorus; but the occasional melodramatic gesture from Gemma Cuervo's obses-sively bereaved matriach fails to make up for the actress's

Lorca was killed 50 years ago to the month. The poetry remains his monument; but to this non-Spanish speaking play-goer, the pace was monotonous, the stage images portentous. This chapter of international theatre merely serves to remind us that under the skin we are all natives of Philistia. The omnipresent locals in Lorca have their counterparts

youthfulness and lack of

strength.

Lora have their counterparts elsewhere in this year's Edinburgh drama. The age of the star gives way (political significance here?) to the production dominated by those who traditionally stand and wait—or rather flounce, glower, gasp, smirk and generally upstage their supposed betters. The upspeaking countiers dominate

18th-century carnival maskers in tricornes and cloaks, the open stage of the Assembly Hall is never free of their poking, prying and leering. Barnardo and Marcellus have to clutch the back drapes together to keep out those insatiable faces for a few moments. to keep out those insatiable faces for a few moments' privacy with Hamlet. They are omnipresent, mopping and mowing and mimicking, miming grief or applause with tiny, silent gestures, uttering purrs or clicks, waving fans in unison like the chorus of The Mikado. Bath parasitic and provocative, they propel and are creatures of court intrigue: a more stylised version of the politic-ally-conscious Russian film of

All of which is fascinating but fails to add up to a coherent and consistent view of Hamlet. The main message of Richard Williams's production seems to be that the medieval antecedent of today's admirably respectable Schleswig-Holstein-Sonderburg-Glucksburg family were a load of loonies. Malcolm Rennie's Claudius, obviously baffled, re-sorts to shouting his lines at an unremitting forte. Jean Marsh, dazzling in a panniered skirt that Marie-Antoinette would have coveted, intelligently hints at a sympathetic Gertrude, but remains a cruelly under-used actress in her own country. Sarah Berger comes

into her own as a raucously in-sane Ophelia. She belts on the tattered remains of her dress hitched up round her thighs, all thrusting aggression, a roaring girl who knees the unfortunate bystander in the a fine Laertes, goes berserk after her death, slapping himself as he keens, just as Hamlet tried to throttle himself in "To be or not to be." When David Threlfall's Prince lets down his reddish-brown hair, he looks like Holman Hunt's Light of the World. In drag, that is, for though Hamlet's traditional black jacket and leggings contrast with the full Casanova/ Venetian of the rest, he spends

This Hamlet is a puzzle. In the closet scene we neither see nor hear the Ghost, so must agree with Gertrude that it is "the very creation of his brain." This contrasts with the earlier sighting when Hamlet writhes under the moving spotlight emanating from his invisible spectral father whose voice is heard, not too distinctly, from various points above us. Pre-sumably unbalanced, this Hamlet is so bizarre that one can only wender at the famed tolerance of liberal Scandinavia.

most of the play in a dress.

unspeaking courtiers dominate After the excessively weeps, is finally seen high above the the Oxford Playhouse Hamlet, not usually considered a play that revolves round mute supernumeries. But from the moment a white-faced figure freezes with a ghastly grin in a silent preamble with sinister calculations (Horatio's grating to the distinct the excessively weeps, is finally seen high above the building, perched on a dazzling red dragon—attached, one hopes, firmly to the end of a crane: a last visual thrill in a spectacle that is impressive rather than moving, monumental rather than human.

Joanna MacGregor's music twangs and hums in the (beautifully dressed) play scene. Rosenkrantz and Guild-

enstern are stylised, almost Commedia, each with a mask on the back of his head. And Richard Kay's Poionius is one of the best. Played relatively straight (for which relief much thanks) as a shrewd politician and still frightening pater-familias, he is authoritative and drily humorous. The production may infuriate but it certainly stimulates, and the audience (as opposed to some critics) loved it.

The chorus is back in its accustomed role in the Toho Company's *Medea*. On the f-st night the heavens confined themselves to the odd spit mercifully, since the Japanese troupe (whose Mocbeth was the sensation of last year's feetival) are performing in the open air.

The courtyard of the University's Old College provides a setting not merely impressive but ultimately magnificently functional. Spotlights travel across the Corinthian columns and darkened Georgian windows, and move along the steps of the terrace. Medea's children are ashen wraiths, their faces as chalky as their white robes. Predictably, the visual side of Yukio Ninagawa's production is groin. Earlier she has struggled, compelling—the eclectic music, shocked against the passion of her brother's kiss. Colin Bruce, a western-sounding ballad to a guitar, is less successful. The chorus of 16 enters in red and black robes, their faces con-cealed by dark veils from the rim of each round, flat hat. To a clap of thunder Medea appears in glittering robes, metallic pendants dangling from her head-dress, false naked breasts lending her the air of a Beardsley Herodias.

This is, however, an all-male Medea (the offstage cries of grief were disconcertingly gut-tural). Last year's Macbeth, Mikijiro Hira, musters enough femininity from body move-ments to flirt sinuously with Aegeus (black and gold stripes). This Medea discards head-dress, splendid surcoat, robe and breasts, transformed into a sexless figure in long

russet dress and balaclava when she undertakes revenge. The effect is operatic. Words count less than the aesthetic sumably unbalanced, this Hamlet is so bizarre that one can
only wender at the famed
tolerance of liberal Scandinavia.

Mr Threlfall is always matchable, not always intellimarches in to kill her children. gible. He must beware of They move in a slow circle in adopting a Bluebottle voice hieratic poses before surging from The Goons — his advice across the courtyard in terror to the players was omitted. at the offstage slaughter. Medea

Massenet in New York

Two of the City Opera's three in a vocal-studio way—expres-new productions this season are sive more of "method" than of Massenet: Werther and Don Outshotte (The third is the Quichotte. (The third is the New York premiere of Anthony Davis's X: The Life and Times of Malcolm X.) Along with revivals of Massenet's Cendrilion, Bizet's Pêcheurs de perles, Carmen and Faust, they make up what the company bills as a Festival of French Opera. The works are sung (more or less) in French, while "super-titles"—phrases of an abridged English translation—are flashed onto a screen above the stage.

Mansouri has the reputation of being a "traffic-cop" producer—not one who reveals the passions or the poignancy of a piece—and he maintained it hy parading principals and chorus in dullest textbook

Jerry Hadley, singing the role for the first time, was the hero. This rising young tenor has recently been accused of bawling: as Percy to Dame Joan's Anna Bolena, as Flamand in Capriccio. In a recent interview he declared that Alfredo

the progress from placing notes conscientiously to being a con-vincing, interesting character.

Charlotte was Wendy White. a mezzo, making her local debut. a mezzo, making her local debut, who has sung in Hamburg and Vienna and with regional American companies. The role is compassable by both Sopranos (Ninon Vallin, Lotte Lehmann, at the Met Emma Eames) and

Anyone tempted --- as people often are—to accuse the City Opera of lacking artistic serious-ness and ambition could support the charge with this Werther: singers going through their paces, not any kind of drama, quite unmoving. Don Quichotte failed for other reasons — chief among them Samuel Ramey's blankness in the title role. John Copley

troupe assembled and garbed was missing in themselves to play a Don performance. Quixote drama. The windmills Ramey has episode was feebly handled; little stage pr Carl Ebert (in 1965) managed it better on the tiny Wexford stage. Massenet's touching final image—Don Quixote asleep and dreaming, then dying, upright, propped against a tree—was lost; the set had no tree.

(Ninon Vallin, Lotte Lemmann, at the Met Emma Rames) and the Met Emma Rames vitality. Victoria of those late Massenet operas that seem to be infused with a that seem to be infused methat seem to be infused with a that seem to be infused with a return it to her in a scene where for a moment Dulcinea's heart is touched, and his is broken; and die with his faithful Sancho beside him. Quixote is absurd but pure and good. The brigands recognize it; Dulcinea finally does; Sancho brings the fourth

act to a powerful close with his tirade as he rounds on the com-pany that has been mocking his master. Capriccio. In a recent interview he declared that Alfredo Kraus, not Placido Domingo, would henceforth be his model. He should aim higher, should listen to Clément, De Lucia, Schipa as Werther. His vocal Schipa as Werther. His vocal performance was careful but monochrome, uninflected, rhythmically plain, not caressing, and the climaxes tended to blare with rose on a few telling melodies, handled with economy, but some of the most touching moments are most touching moments are schieved by simple recitative bring to life. Vanni Marcoux, then, but the general effect was moved by Fugère's utterance of the conservatory, and 10 per cent discount on "after continuous for the conservatory, and 10 per cent discount on "after continuous for the conservatory, and 10 per cent discount on "after continuous for the conservatory, and 10 per cent discount on "after continuous for the conservatory, and 10 per cent discount on "after continuous for the conservatory and 10 per cent discount on "after continuous for the conservatory and 10 per cent discount on "after continuous for the conservatory and 10 per cent discount on "after continuous for the conservatory and 10 per cent discount on "after continuous for the content of the first Paris Quixote, said that the was sometimes so deeply the first paris Quixote, said that the was sometimes so deeply the first paris Quixote, said that the was sometimes so deeply the first paris Quixote, said that the was sometimes of the first paris Quixote, said that the was sometimes of the first paris Quixote, said that the was sometimes of the first paris Quixote, said that the was sometimes of the first paris Quixote, said that the was sometimes of the first paris Quixote, said that the was sometimes of the first paris Quixote, said that the first par Massenet based the score on

as "a sophisticated 'storyoook presentation: Dore's drawings scene, that he found it hard to brought to life on the stage." continue. That kind of detailed, imaginative verbal inflextion was missing in the City Opera

Ramey has a fine voice but little stage presence. (Figaro is the only part in which I have seen him fully alert). To create Don Quixote he adopted a back-ward-leaning posture, moved like a wind-up toy, and kept his face expressionless except when baring his teeth in a careful grin. Joseph McRee's Sancho had some vitality. Victoria Vergara, a tall, beautiful woman, played Dulcinea with cool impossive dignity mised.

is not Cervantes', but something of the original feeling survives in both operas. Nothing much survived in the City Opera presentations; nor was there much feeling for Massenet's own precise, delicate charm. These were coarsely generalised presentations, with little command of period or of style. The singers, women and men alike, didn't even try to look their parts but got themselves up as painted dolls. (Whoever super-vises City Opera make-up has forgotten that it should be unnoticeable by the audience.) Charlotte, overpainted as if to suggest an actress or a harlot, wore a lot of eye make-up and long false eyelashes and had varnished fingernails. The musical manners were similarly

Andrew Porter

LSO's 1986/87 season includes new subscription offer

The London Symphony cert" meals in the Cut Above Orchestra's 1988-87 season will restaurant. open at its Barbican home on September 18 with some 37

The orchestra is also offering a new subscription scheme, which consists of two miniseries of five concerts either in a weekday series in October and November or a weekend series from October to January.

concerts before the end of the

The 1986-87 programme under music director Claudio
Abbado, will include soloists
Viktoria Mullova, Vladimir
Ashkenazy, Rudolf Serkin,
Anne-Sophie Mutter, Jose Feg-Krystian Zimmerman hali. and Peter Donhoe.

Guest conductors include, as well as the principal guest con-ductor. Sir Colin Davis. Yuri Simonov, Sir Yehudi Menuhin, Michael Tilson Thomas, James Judd, Leonard Slatkin and Gery

Bertini Other events include an evening with the Count Basie Orchestra, and an evening to celebrate the 25-year sponsorship of the LSO by the Peter Stuyvesant Foundation.

Two queens/King's Theatre, Edinburgh

Andrew Clements

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PARIS

des Halles. Quatuor Talich: Bartok, Ohana, Dé-

NETHERLANDS Imsterdam, Oude Kerk Addie de Jong, organ, and the Sweelinck Can-torij under Willem Vogel. Bach (Tue).

Jenna Holburg Orchestra conducted by Gert Hofbauer. Waltzes and light opera. Konzerthaus. (Tue, Thur).

NEW YORK

bussy (Wed 6.30pm). Auditorium des

Ballet in a tent at Batte

guez Arias 3. (415 5490).

Park.

an unmitigated disaster.

Perhaps the opportunity to hear a Russian company in two opera as composers as widely chaikovsky operas appealed to the planners; it is possible also that on home ground in Leningrad the production wrong either in Yakov Gordin's library for Mario Stuart, based moved more coherently and the singers showed a semblance of belief in what they were asked

the best — it is impossible to sky's Maria Stuart was a work judge the Maly Theatre's visit worth bringing to Scotland to Edinburgh as anything but an unmitigated disaster. Perhaps the appointment of the story of Maria Story of Mar

libretto for Maria Stuart, based rather improbably on an essay by Stefa Zweig. No English translation was available but the 22 episodes divided into three acts appear to cover all the second of the the relevant historical happenings, assign an important role to John Knox (portrayed rather oddly brandishing a crucifix) and set up the statutory con-frontations between Maria and rather flat (though some theatrical competence might have helped that) but by no means unworkable, given a composer with a feeling for music theatre and the ability to provide a score rich in the colour and incident it seems to

Slonimsky, on this evidence, possesses neither of those qualities in the smallest measure. Born in 1932 he is a professor at the Leningrad

night. Vocal lines - arid attempts at a kind of verismo lyricism — are accompanied either by held chords or skimpy ostinatos; the orchestra seemed to be there just to provide brash, badly scored effects. Stanislav Gaudasinsky's stag-ing just about gets principals and chorus on and off in the right places. The better of the singers were heard more rewardingly in the Chaikovsky's

operas though Olga Korzhen-skaya's Maria certainly pos-sessed the power the role specifies, for making plenty of noise seems to be the extent of the work's ambitions. Meanwhile, the Maly's Queen of Spades continued where its Onegin (reviewed on Friday) had left off, with the chorus apparently unable to keep to-gether, the principals out of tune, the acting style as subtle as semaphore, and the lighting contriving to plunge the singers into total darkness for the first

few moments of almost every scene. The Hermann of Anatoly Kapustin looked at least 20 years too old for the role, and singing hardly justified such implausible casting: he was partnered by a Lisa (Valentina Yuzvenko) whose tone became Conservatory and evidently a wearyingly hard-edged above prolific composer, Maria Stuart the stave. Only Irina Bogasis his third opera, first staged in 1981 and for which he won the Glinka Prize two years mined to give a performance the Glinka Prize two years mined to give a performance later. His score possesses no kind of continuity, no that strident fortissimos were semblance of coherence. It inches from one piece of badly audience's attention. It was executed pastiche to the next; neither a particularly subtle most embarrassing are the nor deeply penetrating porattempts at local colour, trayal, but its straightforward ludicrous travesties of Scottish competence shone like a jewel dances and folk tunes which

Issue of U.S.\$ 500,000,000 PRIMARY CAPITAL FRNs (Series "C") (Floating Rate Notes)

In accordance with the provisions of the Notes, notice is hereby given, that for the three months interest period from August 27, 1986 to November 28, 1988 the notes will carry an Interest Rate of 6 1/16 % per annum.

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S A LUXEMBOURGEOISE

CHICAGO

the San Francisco Ballet with a mixed programme including a William Forsythe premiere, and the Twyla Tharp Company in a mixed programme including a work chore-ographed to a Philip Glass score. s Aug 31. Highland Park

Verona, Arena di Verona: Aida conducted by Daniel Oren with Awilda Verdejo in the title role, Nicola Martinucci (Radames) and Bruna Bagli-

dor, Kenneth MacMillan and him-self, with the American Ballet Thea-tre (from Tue until the end of the month). (474 3718).
Pessaro Rossini Opera Festival, Teatro Rossini: Il Turco in Italia, conducted by Rico Saccani and directed by Egisto Marcucci: Bianca e Falliero (at the Auditorium Pedrotti) with Marilya Horne, Katia Ricciarelli and Chris Merritt, conducted by Donato Renzetti and directed by Pier Luigi Pizzi, who also designed

Pier Luigi Pizzi, who also designed the scenery and costumes. (3 31 84).

LONDON London Philharmonic Orchestra con-ducted by Bernard Haitink, Elgar and Shostakovich, Royal Albert Hall (Thor).

ENO's autumn programme

autumn season opens tomorrow Marriage of Figuro, Madame evening and includes two new productions and five revivals.

Marriage of Figuro, Madame Butterfly, Aida, and The Rope of Lucretia. A restaging of John Copley's production of Verdi's Il Trovatore by Keith Warner begins the season tomorrow with James Lockhart conducting.

James Lockhart conducting.

The English National Opera's The other revivals are The of Lucretia.

A new production of Gilbert

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Arts Guide

Opera and Ballet

Out-of-Towners Series (Dance Thea-ter Workshop): The ninth annual in-vitational dance, mime and perfor-mance whirlwind features this week. Daniel Erzalow from Connecticut in Conspiracies and Collaborations (Mon-Thur). 19th St. W. of 7th Ave (224 2077)

(924 9077). New York City Opera (NY State Thea-tre): The week features Sigmond Romberg's The New Moon with

son's new production conducted by Jim Coleman, along with Cendrillon and Carmen. Lincoln Center (870 5600). Summer-Stage (Central Park): Free new dance series. Diane Martel, Wendy Perron Dance Company (Wed): Sally Gross and Company, Terry Creach/Stephen Koester (Thur). Bandshell at 72nd St. fipm (397 3156).

Leigh Minno as Marianne, Richard White as Robert and Richard McKee as Besac in Robert Johan-

(Incorporated in England with limited liability)

KREDIETBANK

lavinia Festival of American Dance A formight dance festival features Music Billy Eidi, piano: One hour in Italy with Liadov, Liszt, Sacre, Sauguet, Poulenc (Tue 6.30pm). Auditorium des Halles.

timuch (Radames) and Bruna Bagi-oni (Amneris); Andrea Chenier, con-ducted by Gianluigi Gelmetti, with Nicola Martinucci, Renato Bruson and Giovanna Casolla; Un Ballo in Maschera conducted by Gustav Kuhn, with Maria Chiara, Luis Li-Kunn, with Maria Chiera, Lins Li-ma and Silvano Carroli (28 151). Pompeli, Panetenee Pompeiane: Mi-khail Baryshnikov in works by Bal-anchine, John Taras, Anthony Tu-dor, Kenneth MacMillan and him-

Tokyo String Quartet, Beethoven Schumann. Schönbrunn Palace MEW YORK

End of Summer: Music, song and
dance by Polish American Singers
and Dance Company. McGolrick
Park, Brooklyn. 6.30gm.
Scott McIntosh, trumpet recital (IBM
Garden): Part of the free Juliard
Concert series. Tomasi, Koetsier,
Pasch. Wed. 12.30 (56th & Madison).

Bilbao, Faust, La Forza del Destino, Turandot, Tosca and Manon Les-caut Alfredo Kraus and Giuseppe Giacomini and sopranos Eva Mar-

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FINANCIAL TIMES

BRACKEN HOUSE, CANNON STREET, LONDON EC4P 4BY Telegrams: Finantimo, London PS4. Telex: 8954871 Telephone: 01-248 8000

Tuesday August 26 1986

A taxing time for oil

PLEAS OF poverty by oil companies do not, on the whole, cause political pulses to race. Just as the US windfall profits tax lapses below a certain oil shareholders have ridden high for more than a decade on the surge of price increases created by Opec, and they have not invested all those profits wisely.

So, after cutting capital expenditures by 30 per cent to 50 per cent in response to the collapse of crude prices, it is only natural that they should

only natural that they should turn to governments with demands for a lightening of the oil producing countries including hydrology and the oil producing countries including Australia.

The essence of their case. now being pressed hard on both sides of the Atlantic, is that present tax regimes were designed to cream off part of the excessive profits made when it is argued that the imports should be greatly reduced or

On Friday the Norwegian Government showed itself will-ing to meet this case by announcing revised measures which will cut the tax take on new fields from the present 85 per cent to 60 per cent, with a cut in the special petroleum tax (similar to petroleum revenue tax in the UK) from 35 per cent to 30 per cent.

Smaller concessions

In the US a joint committee of the House of Representatives and the Senate has recently agreed special concessions to the oil industry which would greatly reduce the impact of the Administration's tax reform proposals. Oll companies would still have to pay an extra \$850m, but these would be taxes on corporate profits, not taxes on revenue. The US oil companies will no longer pay wind-fall profits tax provided the oil price remains below about \$19

the substantial reliefs for new developments conceded in 1983.

stimulate investment. Similar debates are continuing in other

Reduced incentive

For Western governments the oil companies have three good arguments: first, that a collapse of exploration and development the price of oil was two to four is already hurting employment times the cost of producing it. in areas such as Texas, Scot-Now that the oil price is land, and the north-east of swinging between a half and a England; second, that disthird of its value of a year ago. coveries made in the next few it is argued that the imports years will provide tax revenues and balance of payments benefits; third, that the West needs to discover all the oil it can before the Arab countries

use their huge reserves to regain control of the price. Unfortunately, governments can do little to ensure that general tax concessions will be reflected in increased drilling rather than in higher dividends. Moreover, as oil prices and tax rates come down, investment reliefs provide a much-reduced incentive to drill, especially at current oil prices. But com-panies such as Shell and Exxon are not short of cash for any profitable investment. The pragmatic argument for a major reduction in existing taxes is therefore weak, since the oil companies would find it difficult to show how the tax benefit

would be cycled into specific

investments.

But for future developments no worse, though no more favourably, than any other companies. This is broadly the case in the UK sector of the per barrel.

In the UK, the Government is engaged in a characteristically shrouded discussion with the oil industry about what further concessions might be made in the next Budget after the will have to take big risks the cuberarial reliefs for any and need substantial rewards to find and develop the new effectively abolished fields which the West will need taxes for most new in time for the next shortage.

Non-executive directors

ALL PUBLICLY quoted com- the affairs of companies which panies should have a strong have lost direction. Thorn-EMI. leavening of non-executive Beecham and STC are notable directors on their boards. This examples. faith at the highest levels in cure-all. In the US, the New the City of London, to the York Stock Exchange requires extent that arguments are now listed companies to have at being made for an amendment least two outside directors— Companies Act which would force companies to take would force companies to take being treated on occasion like on outsiders. And, confronted with the challenge to their authority posed by the board of Allegheny Interauthority posed by the board of Guinness in an affair which has stoked up an extraordinary level of heat within the Square level of heat within the Square Secretary of State, and Mr Mile, the response of the Bank Anthony O'Reilly of Heinz, but in the State and the State of the Sta Guinness into appointing a over a peri-number of strong non-chairman w executives with specific respon-this month. sibilities over the management.

Yet the chances are that the newcomers will have their work cut out to exercise significant influence on the company. During the course of its bid for Distillers, Guinness pro-mised to appoint a Scottish non-executive chairman and a holding company board. After the battle, it changed its mind and announced in an offhand way that its chief executive was to combine his job with that of chairman. This caused great offence, not only because Guinness was going back on commitments made in public docu-ments, but also because in doing so it seemed to be sug-gesting that the main task of non-executives was to rubber stamp the executives' decisions.

In the City's view, the job of its new outside directors will be to exercise a restraining influence on a management team which is widely admired for its operating skills, but which has shown itself in this affair to be both autocratic and ham fisted in its dealings with the wider community.

if they are any good, can be of real value in broadening a management's perspectives. A good example is that of ICI, which has taken on very senior industrialists from Japan and the US with precisely this in mind. And there have been mind. And there have been the serveral recent cases where nonseveral recent cases where nonexecutives—in the shape of one
for two forceful individuals—
have intervened decisively in the sex that is available. The hope is that other companies will see the merits of strong outsiders without having their arms twisted.

But non-executives are not a

least two outside directors— which does not stop them from being treated on occasion like of England and the Stock it was only after public expo-Exchange has been to push sure of extravagant behaviour over a period of years that the chairman was forced to resign

Outside directors have perhaps their most crucial and difficult role to play when a forceful executive, who has been used to getting his own way and has a long record of success, shows signs of overreaching himself or of staying on for too long. That is when non-executives need to be willnon-executives need to be will-ing to make waves, and when they need to be seen within the company itself as a lot more than just a necessary evil.

With this in mind, Beecham is planning a structure in which outside directors will have real powers to curb an over mighty chairman in the future. Among other things, they will nominate their own successors-too many outsiders are their chairman's cronies—and they will have a chance to study acquisitions and rights issue proposals before they are put to the full board. As a fully integrated system of checks and balances, this looks an interesting model for other companies.

Guinness is not going this far, although its new directors will Powerful outsiders

This is asking a great deal of the new men. Outside directors, if they are any good. can be removed without the remove the chairman and to fix the executives and their authority is a series of the remove the chairman and to fix the executives are removed without the remove the chairman and to fix the executives are removed without the remove t

Return of the disposable rocket

BOB TRUAX, with three half-built rockets in the garage of his home in Saratoga, is feeling reasonably bullish about the future for the US private-sector space indus-

Mr Truax, a former US Navy engineer whose staff consists solely of 40 unpaid volunteers who work part-time from their jobs in nearby Silicon Valley, plans an initial test flight next year, followed by a launch of a commercial satellite in 1989.

The rocket entrepreneur's company, Truax Engineering, is one example of the type of organisation that President Ronald Reagan hopes to en-courage through his announcement, just over a week ago, that the US National Aeronautics and Space Administra-tion is to get out of the business of launching commercial satel-

At the other end of the cor-porate scale, several big US acrospace companies, including Martin Marietta, Hughes Aircraft and General Dynamics. arm to set up commercial launch operations to take over some of the roles previously performed by Nasa's space church float shuttle fleet.

All the private-sector con-cerns interested in the commer-cial launch business base their plans on versions of expendplais on versions or expendable rockets, such as Titan and
Atlas-Centaur, which have seen
service for two decades but as
a result of the development of
the shuttle fleet were on the
point of being phased out.
While the shuttles return to
earth after a mission and carry
a crew, the expendable vehicles
are destroyed in the process of are destroyed in the process of taking objects into orbit.

As a result of President Reagan's decision, the three vehicles in Nasa's shuttle fleet will be reserved for launches of military and scientific satel-lites together with manned missions to explore innovative space activities, in materials processing for example.

The three vehicles are to be

ATLAS CENTAUR

in 18 flights of the rocket, the company looks likely to launch

\$100m. Although this price may look relatively cheap given

some of the earnings multiples paid for entertainment groups,

it would be double the previous record for a baseball team established when Thomas Monaghan, a pizza fast food

multi-millionaire, acquired Detroit Tigers for \$50m in 1983.

One strong possibility, how-ever, is that the team may not

arrive at the auction block, even if the rest of the Doubleday is sold, because Nelson Doubleday remains highly attached to his baseball.

Not many people are likely to

claim they have benefited from

the Chernobyl nuclear accident which killed 31 and spread

But one is Morris Rosen, the

American physicist who heads nuclear safety activities of the International Atomic Energy Agency in Vienna, hosts to this

week's international "post mortem," Dr Rosen was one

of three top IAEA officials -

the others were a Russian and a Swede — invited to Moscow,

and even to fly over the

Rosen's rise

radioactivity worldwide.

General Dynamics

joined in about 1991 by a fourth craft, a replacement for the Challenger shuttle destroyed in the tragic explosion in January which killed seven astronauts.
The shuttles, none of which will fly until 1988 pending design improvements resulting from the Challenger accident,

of expendable rockets, which firm grip on the commercial tancy group, Centre for Space only a short time ago were launch market.

Arianespace is a particular rising only slowly, settling down technology.

now in the process of being which have caused five accidents re-evaluated.

In the process of being which have caused five accidents re-evaluated. At least until the US gains further experience with shuttle-type vehicles, the older rockets year by 1988, charging some appear simpler, less costly and \$40m a time. Flights of Ariane better suited for one key job for which the shuttle was used; lifting communications satelites, on behalf of paying "President Reagan's decision customers, into the high geosynchronous orbit 36,000 km above the earth.

**Tongus of Ariane building bigger, multi-purpose are, however, suspended until vehicles which can do the jobs of several less complex spacelites, or ferthermore, the companies strengthens Arianespace's position — especially if it can step up its launch rate," comments

**Bound at the Prights of Ariane building bigger, multi-purpose are, however, suspended until vehicles which can do the jobs of several less complex spacelites. Furthermore, the companies which operate satellite networks are are allowed until vehicles which can do the jobs of several less complex spacelites. The provided until vehicles which can do the jobs of several less complex spacelites. The provided until vehicles which can do the jobs of several less complex spacelites. The provided until vehicles which can do the jobs of several less complex spacelites. The provided until vehicles which can do the jobs of several less complex spacelites. The provided until vehicles which can do the jobs of several less complex spacelites. The provided until vehicles which can do the jobs of several less complex spacelites. The provided until vehicles which can do the jobs of several less complex spacelites. The provided until vehicles which can do the jobs of several less complex spacelites. The provided until vehicles which can do the jobs of several less complex spacelites. The provided until vehicles which can do the jobs of several less complex spacelites. The provided until vehicles which can do the jobs of several less complex spacelites. The provided until vehicles which can do the jobs of several less complex spacelites. The provided until vehicles which can do the jobs of several less complex spacelites.

Martin Marietta Much depends, however, on Mr Sam Dauncey, a UK space the speed with which the consultant.
fledgling US private launch Another question mark is industry can organise itself. over the overall demand for The companies which have satellite launchings. From the

declared an interest in this 18 commercial communications activity are unlikely to have vehicles hoisted into the their rockets ready much heavens in 1985 — the tally before 1989. will fly until 1988 pending design improvements resulting By that time, according to owned by government organisations will also play a key part in building the manned space cipally the governments of station which Nasa plans to construct by the mid 1990s.

In theory, President Reagan's which sells rides into space decision clears the way for the return to prominence in the US may well have established a firm struct for Some conservations as well as by companies — the number will fall to no more than three or four this year, a result of the hiatus in Ariane and shuttle launches. Some observers, such as Dr decision clears the way for the using Europe's Ariane rocket— Brad Mesliu, vice-president of the Massachusetts-based consultance of the manned space of the compactal trace years and shuttle launches. Arianespace is a particular rising only slowly, settling down threat. Assuming it can sort a figure, lower than that

Dr Meslin believes that such a figure lower than that projected a few years ago, makes sense because satellite companies are moving towards building bigger, multi-purpose vehicles which can do the jobs

Men and Matters

Union-may need to order fewer space vehicles for the future as a result of the current glut in communications vehicles

McDonnell Douglas

THE US SPACE BUSINESS

By Peter Marsh

The private sector's answer to the space shuttle

now in orbit. According to Dr Meslin, demand for satellite launches may not be large enough to support the kind of privatesector US space industry that President Reagan has in mind. This is especially true if Japan and China, which hitherto have built rockets only for their own use, carry out their plan to enter the commercial launch business over the next few years.

Hughes Aircraft

Others see these thoughts as extremely pessimistic. "There's an awful lot of business out there," says Mr Bob Fisette, Brussels-based vice-president of Martin Marietta International. Martin Marietta has announced plans to start commercial launches using Titan rockets previously reserved for carrying large satellites for the US Defence Department. The company says it has already received 21 inquiries from com-

mercial organisations about satellite launches, President Reagan's decision

Others among the heavy-weights of the US aerospace weights of the US aerospace has been plugging away since industry agree. Hughes Aircraft, part of General Motors and the world's largest satellite tor. Even though it has rate to builder, says it is "very interested" in moving into the commercial launch business. partly to guarantee ejection into space of its own space. Mr Rick Endres directors to space of its own space

grandiose plans to build a powerful, three stage Jarvis roc-ket — named after Mr Gregory Jarvis, a Hughes engineer who was one of the seven killed in the Challenger explosion—which could be lifting off from a new launch site in the Pacific Ocean by 1989.

a new launch site in the Facint Ocean by 1989.

The design for Jarvis, which would need \$1bn in development funds and would take off from Johnston Atoil, a military base near Hawaii, is based on rocket motors which powered the huge Saturn vehicles that took US astronauts to the Moon between 1969 and 1972. As tall as a 20-storey building, Jarvis would, according to Hughes, greatly cut the costs of delivering payloads into space. It would carry into the geostationary orbit up to six individual satellites weighing a total of 10 tonnes.

total of 10 tonnes.

A key influence on the evolution of the commercial launch industry will be the US Defence Department. Although the Pen-tagon will remain a key custo-mer of the shuttle fleet, it will reserve most of its flights for missions where the presence of people is absolutely necessary. Such missions include experi-ments in areas such as sensor development concerned with the Strategic Defence Initiative, President Reagan's anti-missile

programme.

The Pentagon will require expendable launchers to lift as many as 10-12 military satellites a year by the end of the 1980s. These will include communications vehicles in the geostationary orbit together with navigation and surveillance satellites that circle the Earth in lower orbits a few

sibly two of the contractors to lose its nerve and turn its back build vehicles based on these designs. The rockets would see service in 1989 and would be

to take Nasa out of commercial launch activities is "mighty healthy," according to Mr Fisette.

prospects are not bright enough.

McDonnell Douglas, instead, would build Deltas on behalf of a small Maryland-based company. Transpace Carriers, which has been plugging away since

ture-capital sources.
Mr Rick Endres, director of ommercial development, says The company has unveiled President Reagan's announce-randiose plans to build a ment has "created the conditions we wanted." The com-pany plans two flights in 1988, gearing up to 12 two years later.

Mr Endres is considerably more optimistic than some about the total launch market for commercial satellites and says this could amount to 25 annually in the early 1990s.

For the other companies with their eyes on putting objects into space, the presidential de-cision will help mainly by cision will help mainly by signalling to potential investors that putting cash behind rocketry is not something only for cranks. "It will show people the Government is not going to be competing with us," says Mr Truax of Truax Engineering. Having run out of his first \$1m in investment — hence the unpaid workers — Mr Truax is looking for another \$1m\$2m

over the next couple of years. Houston-based Space Services, headed by exastronaut Mr Deke Slayton, has raised \$10m so far to finance development of its four-stage Conestoga rocket. It needs another \$30m, according to Mr Mark Daniels, special projects manager. Space Services is talking to 12 companies about various launch projects, says Mr Daniels, most of them involving ejection into space of fairly small payloads for jobs such as taking pietures of the Earth's surface for

groups such as oil concerns.
With all the new talk about expendable rockets, are rausable shuttles likely to be eclipsed? If the Challenger explosion has had one good effect, munications vehicles in the geostationary orbit together with navigation and surveillance satellites that circle the Earth in lower orbits a few hundred kilometres high.

To ensure adequate launch capability, the Defence Department has handed \$5m design contracts to four companies—Hughes, Martin Marietta, General Dynamics and McDonnell Douglas—to investigate new generations of expendable rockets. Hughes will base its scheme on Jarvis, while the other three will aim to "stretch" the designs for the rockets they have already developed, the Titan, Atlas Centaur and Delta respectively.

The second of the respectively.

In about six months, the Pen. In about six months, the Pen- In essence, he argues that the tagon will choose one or pos-

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A Bla and

"The shuttle has been a service in 1989 and would be tremendous step," says Dr the basis of any commercial Faget, "but really it is still only launch operations that the aerospace companies also move into. anything we need to use it more, Of the four giants, only McDonnell Douglas says it is not interested in running its own launch operations, arguing and learn how to design the re-usable craft that will follow launch

on the future.

A whole new ball game

The Amazin' Mets, New York's fabulously successful baseball team, has been hitting home runs all season in the headlines of the sports pages. But atten-tion is turning to the Mets' per-formance in the business

It looks as if the Doubleday publishing group, which owns the Mets, may be putting itself up for sale, and if it does, the value of the team's franchise will be one of the hottest issues in US eport in US sport

According to Wall Street, the Dillon Read investment bank has recently put together a financial document to circulate to potential acquirers—including, it is said, Robert Maxwell. Doubleday, a paternalistic private group run by Nelson Doubleday, has been ambiguous about its intentions. But the company went through an exceptionally difficult patch in the early 1980s and is barely profit-

able in its publishing operations as a whole.

If the family were to sell, it might be advantageous to do
it as soon as possible before
the proposed new tax bill withdraws some capital gains con-

cessions.

The Mets appear to be by far the most attractive asset in the Doubleday empire with net income of about \$9m in the publishing group's latest financial year. Nelson Doubleday bought the team six years ago for what then seemed the ridiculously inflated price of \$21m.

The Mets were then propping up the bottom of the National League East and had run up the lowest attendance in big-time baseball—around 790,000. this year, fielding a star-studded side of explosive youngsters and canny old soldiers, they will probably pull in almost 3m paying customers

They also look set to run away with the league title and bookies are running them as hot favourites for the World

stricken reactor shortly after the accident. Until then his promotion to an assistant director-general of IAEA was blocked by the Russians. Chernobyl changed all that. After 10 years with the agency he has won both promotion and a \$2.1m boost in his budget for nuclear safety this summer.

Rosen is the orchestrator of the "post mortem" meeting which today gets down to business. The hundreds of business. The hundreds of international nuclear experts Series, baseball's top championship.

Conservative estimates put the Mets' value at around could it happen in our country?

International nutrical experts by exceptional circumstances attending are all under pressing are all un



has joined up with the end of the Bank Holiday jam and people trying to spot the road-widening scheme."

Topped up

Ernest Saunders is a forceful man and has upset more than just the Scottish establishment with his change of heart last month over the top jobs in the Guinness Distillers drinks combine i

Post permitting, Guinness shareholders will now be savouring the "revised board structure" proposals sent out on Friday after long talks with the Stock Exchange and other annulation hadian regulatory bodies,

As ever with such documents the place to begin is the small print. The appendix discloses that before the position of chairman was thrust upon him by " exceptional circumstances "

£195,900 in the year to last September, in turn almost a third up on his 1983-84 salary —and the equivalent of £75,000 from Guinness Inc and Arthur Bell's Bermudan offshoot.

But the publisher of the Guinness Book of Records still has a long way to go to catch up with the field leader in the salaries stakes-Richard dang of BOC with £883,100 in 1984-85. Saunders has leapt from 33rd to seventh in the salaries league leaving James Gulliver, chairman of Argyll, the frustrated bidders for Distillers, well behind in 36th place on £119,000 after a 90 per cent increase. But the Guinness chief ranks behind Giordano, Ralph Halpern, Gerald Ronson, Richard Ringwald, Tiny Row-land and Brian Christopher.

Death departs

Among the Wall Street gurus two men, Dr Henry Kaufman of Salomon Brothers and Dr Albert Wojinlower of First Boston, have reigned supreme for more than a decade. With Wall Street seemingly hanging upon their every utterance, their often bearish pronouncements in the mid-1970s could send the markets reeling -earning the two men the respective nicknames "Dr Doom" and "Dr Death."

Since then Dr Wojnilower, who once likened the deregu-lated US financial markets to a casino, has turned more bullish. Recently he has been arguing that the Fed should continue easing and that the huge US Federal Budget deficit will have little impact on interest rates.

Now the 56-year-old Austrianborn economist is stepping aside as chief economist at First Boston although he will continue as a managing director and senior adviser to the firm. First Boston explains: "His workload was getting to be too much." So Dr Wojinlower will give up being a full-time econo-mist and Fed-watcher in order to devote more time to his supervisory role.

Observer

LOUIS BRANDT



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THE ANGLO-IRISH AGREEMENT

Facing more scepticism than ever By Hugh Carnegy in Dublin

Northern Ireland's long hot summer when the battle between the British Government and the Visionian Government and the Visionian Government associated

Supporters of the Agreement rejected by Unionists for giving Dublin a say in Northern affairs without their consent, felt such threats to play the "Orange card" which in the past had succeeded in blocking political initiatives had to be confronted before progress could be made. Now that the marches are almost over, how hot has the summer been? Has the "Orange card" been faced down and what republican Army, opposed to card" been faced down and what seems to lie ahead for the Agreement?

of view, things have not gone too by killing not just policemen badly. It is true that the RUC and soldiers but also mounting and British troops had to be a murder campaign against deployed in large numbers to civilians working for the police many parades which security forces. ended in violence.

which almost certainly averted extremists determined to keep greater violence but which aroused the fury of the Nation- in their hands and on the alist community and the Irisa government. A special meeting of the Anglo-Irish conference had to be held to smooth over the issue which angered the Irish because Dublin felt strongly that the communities in the North county implied that provocative Protestant marches through Catholic enclaves should be stopped.

Overall, though, the Government could claim that the security forces were able to cope with the violence that arose and that there was little or no security forces were able to cope with the violence that arose and that there was little or no security forces.

This group is comprised mainly of DUP supporters and members of the Ulster clubs, a kind of fundamentalist Protestant organisation formed to oppose the Anglo-Irish Agreement. apparently also with involvement by the Ulster Defence Association, the biggest —and legal—Protestant paramilitary force.

To date they have staged midnight "occupations" of Hillsborough, the County Down town where the Anglo-Irish Agreement. A special meeting of the Ulster clubs, a kind of fundamentalist Protestant organisation formed to oppose the Anglo-Irish Agreement. Agreement apparently also with involvement by the Ulster Defence Association, the biggest —and legal—Protestant paramilitary force.

To date they have staged midnight "occupations" of Hillsborough, the County Down town where the Anglo-Irish Agreement. Agreement apparently also with involvement by the Ulster Defence Association, the biggest —and legal—Protestant paramilitary force. alist community and the Irisa streets, government. A special meeting This

cope with the violence that arose ment was signed, the nationalist and that there was little or no village of Swatragh, County sign of dissent within the ranks of the predominantly Protestant RUC which Loyalists such as the Republic where Mr Robinson Parls of the P RUC which Loyalists such as the Republic where Mr Robinson Reverend Ian Paisley, leader of the Democratic Unionist Was arrested by Irish police, of the Democratic Unionist Hore Such actions are promised. Party, had predicted. Nor has there been, thus far, a repeat these events as meaningless of the attacks on police homes stunts and points out that on and families by Loyalists that

between the British Government and the Unionist community over the Anglo-Irish agreemen; moved on to the streets during the "marching season" of traditional Protestant parades.

As political efforts to try to break down the overwhelming Unionist opposition to the accord got nowhere in the early months of the year, Loyalists threatened to use the annual marches, mostly commemorating victories by William of Orange over Catholic King James II in 1690, to break down the Agreement.

Supporters of the Agreement,

There have been other worrying developments associated with the marches, however. From the point of view of the Catholic minority, the most sarious is the revival of sectarian violence by Loyalist extremists. In North Belfast, breaked dozens of Catholic families have fed their homes in Protestant areas, particularly in Lisburn, South of Belfast, because of frequent night-time attacks.

In Lisburn, nearly 80 Catholic families have had to be rehoused and more than 40

Republican Army, opposed to the Agreement for different reasons, has continued to stoke From the Government's point the conflict and bait Protestants

The other feature, especially Portadown, in County
Armagh, provided a special difficulty when Loyalists were
allowed by police to parade
twice through a Roman Catholic
area of the town, a compromise
which almost certainly averted
which almost certainly averted
greater violence but which



Mr Peter Robinson (left): pushing Paisley aside?

Clontibret escapades, the RUC Unionist Party, the DUP's anti-was tipped off and managed to agreement partner, is disturbwas typed on and managed to prevent other demonstrations taking place. Certainly, these Loyalists have not proved much yet and it was notable that the thousands they hoped would attend Mr Robinson's court hearing in Dundalk earlier this month turned out to he favor

years from now. (Sir) Peter G. Masefield.

Doods Way,

Reigate, Surrey

Price, choice

After two weeks we had re-

and sickness.

We went to see three of the agencies who had replied and found that none of them had the slightest idea of how to pre-

and design

agreement partner, is disturb-ing for those hoping that a moderate strain of Unionism may emerge. Within the OUP there is

almost abject despair that Robinson-style politics is gainhearing in Dundalk earlier this ing momentum. This month, turned out to be fewer than 150.

However, the eclipse by the hardliners of the Official to the fewer as senior aide said, he was in an analysis of decisions will emerge over than ever within Northern Ireland itself that it is — as was intended — the flolowing months.

The main concerns here in clude the repeal of the Flags and Emblems Act, which restricts the display of Nationalist expense of the IRA.

impossible position, unable either to endorse or condemn the antics of Mr Robinson, recognition of the Irish language, changes in the police gage, changes in the police complaints procedure, and response uncompromising of Unionist leaders.

This is unlikely to prove plain sailing. The reveal of the

apparent to Mr Paisley as the most uncompromising of Unionist leaders.

The problem for the OUP, or any Unionist with any clout a dialogue with the Government, is that the terms for doing so simply do not exist. Any artempt that took place while the Agreement progressed would be howled down by the hardliners. The fate of Brian Faulkner, the Unionist leader who agreed to the 1974 Sunningdale power-sharing deal with Nationalists and was drummed out of Northern Ireland politics as a result, is still all-too-well remembered.

Unionists' inclination to deal with Dublin, narrow as it is, was

with Dublin, narrow as it is, was even further eroded in June when a proposal to introduce divorce in the Republic was divorce in the Republic was the summer, complicated by the defeated in a referendum, reinforcing Protestant fears of the influence of the Catholic Church in the South.

though it may be as tricky as the summer, complicated by the growing likelihood of an early election facing Dr Garret Fitzthe influence of the Catholic Church in the South.

This virtually rules out any Loyalist opposition may not hope that once the marching have halted the Agreement as hope that ouce the marching season is over, conditions it intended and the two might exist for progress under the Agreement towards all-party contact in the province. Mr John Hume, leader of the Catholic Social Democratic and Labour Party, has said he believes that in the autumn some Unionists may emerge ready to talk. But the British to mark its first anniversary on November 15. resigned to the fact that this will not happen for some time the two parties or other Loyalist

What they are left with is a series of measures being dis-cussed within the inter-govern-mental conference which, in the words of Mr Nicholas Scott, the Northern Ireland Minister, are designed "to reassure nationalists" whose support for the Agreement is vital if it is to have any success. Much of the thrust of the Agreement was to tackle the alienation Nation-alists felt from the system of government in the province and thus undermine support for the IRA and its political wing.

The inter-governmental conference will start meeting again in September after its summer break, and both governments have signalled that a number of decisions will emerge over the flolowing months.

for the two governments.

In sum, the autumn looks as though it may be as tricky as

groups, there is a feeling that all the Agreement has done is stir up trouble, further divide the two communities and put back any prospect of all-party political agreement.

The reaction of the two governments to this is that the Agreement was only the start of a long process of showing Unionists that any political settlement in Northern Ireland must be on the basis of equality for Nationalists. This summer, said one Irish Government official, the step down that road was not to trump, but to erode, the Orange card.

So, as the new season beckons, the agreement is still more or less on course, but prob-ably facing more spepticism than ever within Northern Ire-

Lombard

All tanked up but nowhere to go

By Max Wilkinson

prices and after a decent inter-val of about three days all the other companies have been "compelled" to follow suit. By this means the companies avoid falling foul of competi-

tion laws which would force them to register any concerted agreement to fix prices. Not for them the furtive telephone calks or a smoke-filled room at the back of the Athenaeum; their exchange is such that con-spiracy could not possibly be discovered. It is on the front pages of the national news-papers. Petrol prices exert a peculiar fascination over the British public, perhaps partly because of the annual Budget ritual.

However, so far this year the petrol companies themselves have torpedoed each concerted price rise much faster than the Office of Fair Trading could have hoped to do. Soon after each price rise, competition between the 60 to 70 wholesalers supplying the 20,000 petrol sites has eroded the price again. As a result the present price of 165p is 23p below its level in February and still well below the 175p which one large comments are it assets. one large company says it needs to make a 12 per cent return on its assets.

Where do all these whole-salers get their cheap petrol from? Some have been able to make a quick profit by picking up cheap cargoes on the Rotterdam spot market and selling at a discount in the UK. However, most of their supplies come from the 12 larger companies (including all the best known the compani-brand names) which have re-(including all the best-known a price cartel.

SPARE A thought for the poor petrol companies as you race past a pump offering four-star at 165p a galion. They are faced with an appalling propaganda problem.

For the fourth time this year they are starting to prepare the public for a concerted rise in pump prices, hoping to repeat the exercise of the second week of August when, by all pushing together, they managed to get four-star up 7p to 185 a galion.

A faintly ludicrous pattern has now been established. It starts with one petrol company briefing the press that margins have shrunk to an intolerable thinness. A few days later another oil company announces that it is compelled to put up prices and after a decent interval of about three days all the other companies have been "compelled" to follow suit.

By this means the companies they had not enjoyed for many

This year, however, the fall in crude prices has been too much in the news for its effect on pump prices to be ignored. In case anyone should forget that refiners had accelerated out of the years of lossmaking or low profits, Mr Lawson re-minded everyone in his Budget speech, just to get the ball roll-

ng, so to speak. Yet the oil companies have a relatively good case. Because nearly 70 per cent of the price at the pump represents excise duty and value added tax, a fall in crude oil prices has much less effect on the price than most people seem to expect. The cost of raw materials is now only about 32p per gallon.

Yet whatever the oil companies say about a "fair return," the fact remains that there is still considerable overcapacity in the refining industry. The harsh laws of economics say that free com-petition will reduce margins until the least efficient pro-ducer fails to cover his operating costs and goes out of busi-ness. This is what has been happening in recent years. Since 1980 a quarter of Europe's refining capacity has been closed. This painful adjustment is not yet quite complete and since refiners' costs are now pretty similar, that means a lean time for all. The only alternative is something the companies cannot talk about and cannot make work—

Exchange rate stability

From Mr J. Williamson ments (August 13) regarding the need for a more competitive sterling exchange rate are com-pelling. And, as it happens, his estimate of a sensible target for the DM/sterling rate (2.80)

is very close to my own. Nevertheless, the particular Nevertheless, the particular phrase that provoked Samuel Brittan (August 7) was unfortunate. No one should want to see the exchange rate "set on a firmly declining path," for this would both perpetuate the high interest rates that are now being used to prop up the pound at the high a level and act is at too high a level and act is an open invitation to a re-acceleration of wage inflation.

What is needed is not a de-What is needed is not a de-clining trend for the exchange rate, but a once-for-all down-ward adjustment to a realist c level. From then on policy should aim to keep the rate roughly constant in real terms, unites and until evidence develops that Muelibauer's estimate of the real rate needed to sustain a revival of British manufacturing is mistaken.

manufacturing is mistaken.

If inflation can be controlled by the sort of measures endorsed by both Brittan and Muellbauer, a constant real exchange rate will be compatible with a constant nominal exchange rate, or even with some nominal appreciation. To the extent that the British economic establishment always seems so half-hearted in its commitment to the objective of price stablishment. half-hearted in its communeat to the objective of price stabi-lity and that John Muellbauer's phrase suggested sympathy with this position, one can under-stand Samuel Brittan's stric-

John Williamson. (Senior Fellow), Institute for International r.conomics. 11 Dupont Circle NW, Washington 20036, USA.

The BMA and tobacco

From Dr G. Myddelton
Sir.—The statement by the
Government's Chief Medical
Officer that smoking causes
about 100,000 deaths in Britan
per year, quoted by Dr John
Dawson on behalf of the British
Medical Association (August
14). has no scientific validity
and is based purely on dubious
statistical evidence.

I presume the figure has been

I presume the figure has been calculated by adding the 40,000 odd deaths from lung cancer, all assumed to be the result of smoking, to some 60,000 out of the 160,000 or so deaths from the 160,000 or so deaths from coronary heart disease, also commated to be the result of characters. Whatever toxins in characters, whatever toxins in characters smoke are considered to be the causes of these two to be the causes of these two totally different diseases it is a coincidence beyond belief that a coincidence beyond belief that both should only occur in

Letters to the Editor

cigarettes and not in pipe or cigar smoke. Statistically the death rates of pipe and cigar smokers are virtually the same as for non-smokers, and nobody has yet found a single chemical agent in cigarette smoke which does not also occur in pipe and eight smoke.

Further scientific research into all possible causes of lung cancer and heart disease is urgently needed and the British Medical Association should be demanding such a programme rather than indulging in mere propaganda.

(Dr) Geoffrey Myddelton, Blue Moon, 1867 Glutieres-sur-Olon, Vaud, Switzerland.

Shortages north of Watford

From Sir Peter Masefield
Sir.—I am sorry that Mr B. R.
Dewing (August 18) and the
chairman of Manchester Airport (August 19) take such
short-term, and parochial,
views of the looming need for
additional airports capacity in
the UK — not only south of
Watford.

Mr. Haith

Dewing (August 18) and the chairman of Manchester Airport (August 19) take such short-term, and parochial, views of the looming need for additional airports capacity in the UK — not only south of additional airports capacity in the UK — not only south of watford.

Mr Keith Barnes quotes, with understandable pride, the 21 per cent growth of air traffic diversions of traffic thither airport. He looks for future diversions of traffic thither from London's airports. But, however well it can cope now, Manchester airport is, likewise, heading for a capacity problem. Less than eight years ago Gatwick—then, also, "an uncongested hub"—was handling a volume of air traffic broadly comparable with that through Manchester airport today. Now, Gatwick is approaching saturation on its single runway. There is every indication that the experience shows has to be allowed for the consultations, y inquiries, and then the constitution processes essential to meet the needs. The urgency for action is going to be the omer acute because of precisely the accelerating development of the consultations are serviced to which allowed for the consultations, inquiries, and then the construction processes essential to meet the needs. The urgency for action is going to be the more acute because of precisely the sceelerating development of regional air services to which

sent themselves to a prospective client. Two of them imme-diately told us that we needed a new and more impressive logo, but when we looked at their logos we found them drab and unimpressive. One agency had the most scruffy and untidy reception area and obviously had not considered the importance of creating good first impressions Indeed, both north and south We settled on one of the of Watford we have to take this prospect seriously so that our

three, and the managing director and another director visited successors do not find them-selves with inadequate resources us and asked many questions They promised to present their — to the great national dis-advantage — when the 21st Century begins, less than 14 proposals to us quickly.

For three weeks we heard nothing. We then telephoned and were told that they were intending to telephone us that very day! An appointment was made for the presentation, but two days before the event a postponement was asked for.

Another date was made, but we received another phone call, once again postponing!

From Mr S. Gregory
Sir,—Nick Garnett's note on the risks of cost - cutting (Auugst 8), followed by Mervyn Unger's letter (August 16) on price and choice, have been underlined by the European Management Forum report summarised by William Dullforce (August 18). This suggests that British industry virtually specialises in low-value products.

There are alternative com-From Sandra Champness
Sir.—One would be hard
pressed to find a more whingeing article than that published August 18 in your architecture column.

Quite obviously, the new Lloyd's building has faults which must be remedied but it was becoming obvious that the old Lloyd's building in all its white-marbled elegance was beginning to fall far short of requirements. requirements.

There will always be those who deplore change, but with its recent sad history Lloyd's can well do without this minor carping to add to the problems.
It is a pity the "Lloyd's member" was not prepared to be named particularly since, as he so self-righteously points out, he was one who "did not fall for it" when plans for the stunning new building were originally drawn up.

Sandra Champness. Stoneraise, Plummers Plain, Horsham, Sussex.

Choices in cheques

From Mr K. Tunstell.

Sir, — Harold Baldwin's article (August 16) mentioned that most companies now cross their cheques "not negotiable" for protection against claims should a thief negotiate their cheques. To similarly protect their personal customers I would suggest that banks supply cheques with pre-printed "not negotiable" crossings, or at least offer the facility.

ceived replies from only five.
We telephoned the remaining
seven—three of them said they
had not received our letter, and
four made excuses for not
responding, blaming holidays
and sixtuess Keith Tunstall. 39 Grove Street, Leamington Spa, Warwicks,

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FINANCIAL TIMES

Tuesday August 26 1986



RESERVE BANK SAYS ECONOMY 'SUBDUED BY LACK OF CONFIDENCE'

SA capital outflow hit \$1bn in first half

BY ANTHONY ROBINSON IN JOHANNESBURG

THE SOUTH AFRICAN economy, year will be in the 1.5 to 2 per cent hit by social unrest, remained subdued by "a lack of confidence and a about the future" despite the prospects for a more vigorous upturn. the country's Reserve Bank said in its annual report, released at the

recovery from the 1984-85 recession

It regained momentum in the second quarter, but because of the weakness over the first half as a weakness over the first half as a whole, the bank estimates that real gross domestic product growth this to a reduction in the first-quarter

range, rather than the 3 per cent growth forecast at the time of the

economic sanctions and news of continued social unrest" were the main factors behind the outflow of R1.56bn of short-term capital in the A continuing capital outflow of first half. The RI 09bn loss of long-R2.64bn (\$1.02bn) was recorded over the first half of this year. The foreign loans under the debt standstill introduced in September last which began in the third quarter of 1985 faltered in this year's first with foreign creditor banks. The quarter. outflow of R9.23bn in 1985 as a

current account surplus to an annualised rate of R4.3hn. But this rereasonably be expected for 1986 as a whole," the Reserve Bank said.

"A disturbing feature of the ex-penditure trends in the year to mid-1988 was the behaviour of real gross fixed capital investment which continued on the downward course it has found itself on since the first quarter of 1982." Because of lower investment, the paring of invento- growth. ries and the recession the volume of imports declined by 13.5 per cent in the four quarters to mid-1986.

The decline in private sector inin public sector investment espe-

cially by South African Transport Services, the railways and harbours covered in the second quarter to an authority, which cut investment by annualised rate of R6bn. "A surplus of the order of R5bn to R6bn may and the electricity corporation Establishment of the condition of the com, which trimmed its investment spending by 28 per cent.

> High inflation and rising unemployment led to a 7.7 per cent decline in real incomes in the first quarter of 1986 and this, together with an increase in the savings ratio, contributed to the weakness of consumer demand and faltering

Despite the absence of a "more spirited revival" in consumer demand and the persistence of uncertainty about the future, the report said: "A variety of conditions have been created that eventually should

prove conducive to a more positive

These include the relaxed stand of monetary policy, low interest rates in real terms following 11 reductions in the bank rate from 21,75 to 10.50 per cent between May 1985 and August 5 this year, and the

more expansionary approach to Government spending. The report also cited the effect of rand depreciation which both dis-in such namby-pamby takeover courages imports and encourages markets as Wall Street and London. ue of export proceeds. At the same time, however, the inflationary effects of rand depreciation remains a major concern, especially after the rise in the July inflation rate from 16.9 per cent to 18.2 per cent.

Clash with Mozambique,

Sellafield a hit with tourists

BY IAN HAMILTON FAZEY IN LIVERPOOL

THE CAMPAIGN by British Nuclear Fuels (BNFL) to attract summer visitors to its reprocessing plant at Sellafield, in north-west England, has been so successful that new, permanent jobs have been created and special investment is being sought to improve facilities for next year, when the campaign will continue.

The exhibition centre at the plant has been packed throughout most of the school holidays, with many visitors making special day trips from all over the north of England to see it, rather than just calling in while on a holiday in the nearby

Numbers of visitors for this year are now expected to exceed 100,000 - against 30,000 in 1985. In July, the first month of BNFL's media promotion campaign, the figure of 10,000 was four times bigger than the same month last year. Wet weather in August swelled numbers towards 1,000 on some days.

Sellafield reprocessi works has restarted after a fourday shutdown when levels of radiation which could have breached new government safety limits were found in waste due to be discharged into the Irish Sea.

The centre is now to be kept open seven days a week throughout the year, rather than on weekdays only during the winter. The exhibition itself is to be doubled in size, taking over another floor of the building

A proposal is also being put up to the BNFL board to build a viewing platform nearby that will offer panoramic views of the vast site and enable photographs to be taken.

Some new jobs have been generated by the need to staff up the centre to cope with the increased throughput of people. In addition, guides have been required for the

tours of the site offered to all visi-tors to the exhibiton. Total jobs associated with the centre and tours have risen from 18 to 30.

What has surprised BNFL is that so many people have been willing to travel so far to see what looks nothing much more than a gigantic building site. Sellafield is at least 75 minutes from the nearest motorway and the journey takes up to 20 minutes longer if there is much tourist traffic.

Surveys of visitors have revealed deep interest, and sometimes worry about Sellafield's activities, plus a lesire by people to find out things for themselves. Have they been converted to Seliafield's case? Dr Bill Wilkinson, BNFL deputy

chief executive and the directors in charge of the site, says: "People don't necessarily think the place is the best thing since sliced bread, but they tell us that they leave a lot better informed and much less concerned than they were when they

French N-plant mishap likely to delay opening

BY DAVID HOUSEGO IN PARIS

clear power station in eastern an accident at the weekend which led to the flooding of underground galleries during the final verification procedures on a reactor.

Officials of Electricité de France (EDF) said yesterday that there was no radioactive danger and that the galleries had been emptied of water. But the accident spurred fur-ther protests by ecologists at the site and by the West German authorities of the Saar which is adjacent to the newly-constructed sta-

EDF yesterday believed that the mishap had been due to the premature opening of a sluice gate during preliminary testing of a reactor - although a gate unconnected with the reactor's main cooling system. An inquiry is, however, being carried

Because of its proximity to the West German border and because France is likely to be delayed after of Chernobyl, the new Cattenom station has been the subject of continuing protests in recent weeks.

> An official at the plant noticed the unusual rise in the water level on Saturday night when the temperature was being raised in a primary circuit on one of the 1300 MW reactors. It was felt that the flooding could damage equipment needed in the full running of the reactor which has already been loaded with 118 tonnes of uranium. Cattenom is due to come into service on September 15.

Reuter reports from Madrid: Asco 2. Spain's newest nuclear reactor, has been ordered shut after malfunctions in its steam generator system on Friday. The 930MW reactor, supplied by Westinghouse of the US, is located near Barcelona.

Conrail to be sold by

edged defeat in its bid to sell Con-rail, the state-owned railway, to Norfolk Southern, a rival railway, and cleared the way for one of the biggest stock market offerings in Wall Street's history.

Norfolk Southern, which won US Government approval to buy Conrail in February 1985, withdrew its \$1.9bn offer on Friday. Mrs Eliza-beth Dole, the Transportation Secretary, who had been backing Norfolk Southern's offer, said that she would work with Congress to return Conrail to the private sector through a public offering.

This could happen before the end of the year, Wall Street analysts be-

feat for Mrs Dole, who has faced fierce criticism in Congress over her plans for Conrail. The company mains of Penn Central and half-adozen other bankrupt railways in the north-east.

The Government has been trying to get out of the railroad busines

Mrs Dole decided to sell Conrail to Norfolk Southern after reviewing other options. It was argued that Conrail was not strong enough to

survive on its own. The Senate approved the Government's plan, but this ran into serious opposition in the House of Representatives, where Mr John Dingell, chairman of the Energy and Commerce Committee, opposed the Norfolk Southern offer

As every month went by, Conrail's fortunes improved. Last year it earned \$442m on revenues of \$3.2bn. Mr Dingell does not believe that Conrail's long-term health is questionable, and has said that the best way to return Conrail to the private sector is through a public offering.

been happy about the prospect of being owned by Norfolk Southern and hired Morgan Stanley, the Wall Street investment bank, which of-fered to match Norfolk Southern's bid by making Conrail public. Soon after Allen and Co and First Boston, two New York investment banks,

made a rival offer. Mr Dingell, a Michigan Democrat, praised the statesmanship of Mrs Dole and Norfolk Southern and pledged to support a renewed effort to return Conrail to the private sector. This return has been a high priority of the present Administration.

The railway has had the benefit of \$7bn in subsidies and labour pro tection payments, but in recent years has been streamlined considTHE LEX COLUMN

When Australians start to roam

The coincidence last week of a deflationary Australian budget and Mr Holmes à Court's polite but aggressive letter to USX is not entire ly accidental; and the link will not be a great comfort to managements who have survived and prospered If the Australian entrepreneurs, as imaginative a bunch of people as ever graced a boardroom, cannot out of their home market, they will be looking for growth where English is spoke and assets are cheap.

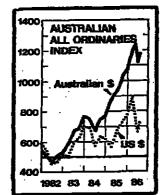
The foreign exchange and fixed-interest markets thought at first they liked a budget specially tailored to their preoccupations. Bond yields climbed up again and the Australian dollar lost its modest gains when the markets had second thoughts about the outlook for the balance of payments and inflation. The fall in commodity prices will probably go on swamping the ben-efit of currency depreciation till the new year, while the run-down manufacturing base will go on needing capital imports. Until the really horrifying current account figures are out of the way, interest rates will have to bear the burden of defending the currency.

Ironically, the Australian stock market sailed through the bad news for interest rates and consensus forecasts for economic growth well short of the Treasurer's 2.5 per cent. The fact that the Australian dollar's fall has preceded the seizing up of the economy has left profit margins moderately well-protected; and wage discounting should leave room for a growth in industrial earnings of, say, 10 per cent next

But this is not the sort of thing to

excite the likes of Mr Holmes à Court: News Corporation has already allowed its Australian operating assets to shrink to 20 per cent of the whole. Having judged the strength of the economy correctly for four years, the takeover specialists have now sniffed out every asset or cash-flow play up to and in-cluding BHP. Current domestic interest rates set very demanding rates of return; but gearing up in risky game even for the resource companies, whose "natural" hedge in their US-dollar-denominated minerals has proved no hedge at all

with commodity prices falling with such a bump in every currency. If there is a corporate opportuni-



ty in Australia, it will came from a cosening of the rules on foreign investment for, say, Japanese expor-ters who need a cost base in other than yen or UK companies who might want to buy their Australian minorities at a discount.

Whether Mr Holmes à Court has Wall Street has been looking at a doubled, an Australian would be reprums such as an overfunded pension scheme, Mr Rolmes à Court could be on the way to picking up some high-quality energy properties on the cheap. The arbs were certainly piling into USX last mach high-quality and up to me excess capacity in beer production, this would also be a could be a rectainly piling into USX last mach high-quality in beer production, this would also be a players in the market.

A half-way house could be a rectainly piling into USX last mach high quality in beer production, this would also be a constant of the market. tainly piling into USX last week. Mr Holmes à Court might even have decided that his credit lînes are wasted on such a tiddler in a dethe time might be ripe to depart such popular brands as Old Watery.

British brewers

ain's Monopolies and Merges Comprobably tastes the same the world mission into the supply of beer in liever: it is a commodity market censed premises has done notable ruled by price competition.
injury to a sector of the market if the tie is to be abolished, the which had been high fashion. Since brewing companies would not be tive at the beginning of July, the production shares on the rating of, breweries sector has underper-say, food manufacturers, while the formed the London All-Share index distribution shares could be sold on

sation of the sector comprises Guinness and Grand Metropolitan. A verdict from the commission unlikely for at least two years. If it went further than its 1969 predeces-sor and recommended a complete dismantling of the tied system then doubtless royal commissions and

cts of parliament would follow in its wake. Betting on the outcome of all these deliberations will doubtless provoke much two-way business in the brewers - some consola-tion for stockbrokers who have already suffered the attentions of the Office of Fair Trading's Sir Gordon

The end of the tie could well lead to yet another heavyweight foreign raid on a beloved British institution. Among the UK competitors, those with the greatest reliance on tied business would in theory be the biggest losers. But that is not a recommendation to sell Bass. In a truly competitive environment the vinners will be those with the best bought shares in USX, time (and brands and the best sites, and that the SEC filing) will show. Whereas might also mean Bass.

The losers would appear to be the strike-bound steel and energy com-pany, whose share price is back at the shrinking ale side of the beer its 1982 level while the market has business, and without the financial clout to fight what would become an minded of what BHP looked like intense advertising battle. It is all three years ago. Given that USX's the more peculiar that the regionals steel assets are a relatively small have fallen only half as far as the proportion of the whole, and there nationals. If the result is closure of are substantial off-balance-sheet some of the excess capacity in beer

least one brand other than that of the parent. This again would favour those with the best brands, unless the owners tried to preserve their ssed economy as BHP and that guaranteed market by offering only London Broker Wood Mackenzie has argued that a recommendation to sweep aside the whole system would necessitate an inquiry into such matters as the vertical integra-The spectre of an inquiry by Brittion of oil companies. But petrol

the rumours of the inquiry became obliged to divest, but could more adby 5 per cent. This understates the a food retailing multiple. As the damage to those shares most close-case of Trafalgar House and Fleet ly identified with the tied-house showed, the parts may add up to trade, since almost half the capitali-

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SIEMENS, the West German electricals group, may take a significant holding in a new company combin-ing the computer hardware and peripherals business of BASF, the giant chemicals group, and some of its own software operations, it emerged vesterday. BASF said it would spin off its ac-

tivities - with annual sales of DM 600m (about \$300m) last year - into a new company within the next several months." It would, however, continue its

own production and marketing of computer discs and tape cassettes. where it ranks as one of Europe's market leaders with annual sales of some DM 1.2hn BASF acknowledged yesterday that it was negotiating an arrange-ment under which Siemens may

transfer some of its software operations, with sales of some DM 400m. would thus have total annual sales of over DM 1bn. BASF markets an IBM-compati-

ble computer mainframe produced by Hitachi - of which it has sold some 400 since 1980 - as well as Hitachi laser printers. BASF has for several years maintained that these operations, al-

ing, do not fit into the mainstream of the company's operations. Siemens on the other hand would gain access to IBM-compatible mainframes, placing it second on the West German market and improving its competitive position against IBM.

Siemens' current agreement to sell mainframes manufactured by Fujitsu of Japan expires in 1989.

UK plans to try gilts auctions

series of auctions of UK government securities, similar in style to the US Treasury bond auction, after the transformation of the structure of London's gilts market in October. Britain's central bank is expected to run an experimental series of

perhaps three or four auctions, probably beginning with shorter dated conventional gilts. So that investors could be certain what they were bidding for, the Bank of Eng-land would give an assurance that no further stock of the same type would be issued for a specified peri-

the auction might take is likely to be delayed until the upheaval of Big Bang on October 27 has settled The auction system of selling

gilts, where a known quantity of bonds is offered at specified intervals, is felt to have advantages, particularly in assuring the regularity

THE BANK of England plans a trial of funding for the Government's new and more heavily capitalised however, expected to replace the present tap system, which is felt to allow considerably more flexibility in managing the gilts market, for more than a small proportion of overall gilt sales.

Tenders, where dealers and investors can submit bids at a specified time, are already used for some gilts sales in conjunction with the tap system, and greater use is expected to be made of them to ensure fair allocation of stock around the 27 market makers in the gilt market's new structure.

In a tender, unlike an auction, all Discussion of the precise form successful bidders receive stock at a common price, which may be lower than the price they hid, and not all the stock offered need be allocat-

A gilts auction has not been pos-sible in the present structure of the UK market, which is dominated by only three major jobbers, but the

being on October 27 makes the auction system practicable. Indeed, some participants in the market particularly the US-based invest ment houses, have viewed a move to auction as essential if the market is to function smoothly with so many primary dealers.

The central bank, however, besides its unwillingness to give up the flexibility of the tap, is known to have been concerned at the experience of some recent US Treasury bond auctions, where the market was squeezed after major Japanese securities houses had bought up a large proportion of the stock of-fered. In addition, the UK gilts market includes a much wider variety of maturity dates, interest coupons and bond types - including indexlinked stocks - than the US market and this would make a complete move to the auction system more

People Express grounds Frontier

press, the aggressive low-cost day after it was forced to ground its Frontier Airlines subsidiary. It warned that Frontier could be forced into bankruptcy proceedings if its pilots did not agree to a new wages pact, write Terry Dodsworth and William Hall in New York.

though profitable and quickly grow-

ed and its unions. To date, United's

funds to Frontier." United and the pilots' union have

The move underlines the deteriorating financial condition of People Express, which had been counting on the sale of the Denver-based carrier to United Airlines for \$146m to solve its short-term cash problems.

People Express said: "We deeply egret that this step had to be taken but we were left with no choice. The sale of Frontier to United is contingent upon agreement between Unit-

THE CRISIS enveloping People Expilots' union has failed to reach agreement with United. Frontier is out of funds, and in the absence of assurance that the sale to United will take place, People Express is unwilling to commit any more of its

> been in a tense negotiating battle for the last six weeks, with the Frontier pilots demanding parity with United employees within two years. United has offered to phase in equivalent pay rates over a five year period. After last minute efforts to solve the impasse collapsed early yesterday. People Express said that its lawyers were preparing to file a petition for relief under the bankruptcy code.
>
> People stressed that the bank-

ruptcy proceedings would affect on-

not involve its other operating units, People Express Airlines, Britt Airways and Provincetown-Boston Airline. According to the company, all these divisions will continue to operate at their full service levels and "are experiencing very high levels of customer bookings."
People Express's \$300m acquisi-

tion of Frontier last autumn marked the high point of its strate gy of rapid expansion into the lowcost airline market. Since then Frontier has been losing as much as \$10m a month. It has been threatening to drag down its parent, itself facing financial difficulties as its rapid growth policy brought it into head-on competition with more strongly capitalised established air-

Continued from Page 1 new management team was set up

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Unions reject Montedison bid

Continued from Page 1

The future ownership of Fermenta has become uncertain again as speculation grows that Mr El-Sayed is seeking to put together an alter-native "Swedish solution" to the Montedison takeover.

He is coming under pressure to find a buyer for all or part of his Dr Pepper, which made net profits stake in the company before the end of the year when repayment is due of part of his SKr 1.4bn personal debt accumulated earlier this year when the planned sale of a 25 per cent stake in Fermenta to Volvo, the Swedish automobile and industrial concern, collapsed.

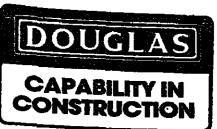
Fermenta still faces the threat of an eventual expulsion from the

Cadbury stake in Dr Pepper

Canada Dry, with sales of \$242m and \$19.7m profits after tax but before extraordinary items in 1985, has almost 3 per cent of the North American soft drinks market while of \$60m last year, has 7 per cent of the \$26bn US soft drinks market. Dr Pepper has few sales overseas

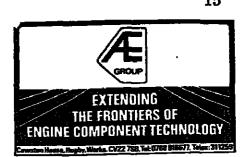
The legendary 72-year old Mr Woodrow Wilson "Foots" Clements is to stay with Dr Pepper's new owners as "chairman emeritus" said Mr Hicks. Mr Wilson has been with Dr Pepper for 50 years and is widely credited with its marketing

in North America



SECTION II - COMPANIES AND MARKETS

FINANCIAL TIMES



Firestone more than doubles income

By William Hall In New York

FIRESTONE Tire & Rubber, the second-biggest US tyre manufacturer, yesterday reported more than doubled third-quarter net income of \$27m, or 70 cents a share, after including a 56, or 15 cents a share, after-tax gain from the partial liquidation of inventories.

The group's sales fell 3 per cent to \$961m, and sales for the nine months to July 31 fell from \$2.83bn to \$2.69bn. Net income for the nine months totalled \$121m, or \$3.07, compared with \$50m, or \$1.18, last year. The nine-month figures include \$68m, or \$1.67, as a result of the recognition of previously deferred pension reversion gains.

quarter totalled \$64m compared with \$34m. The latest period included a pre-tax gain of \$11m reflecting the partial liquidation of inventories. Operating income from the group's international tyre operations rose by 30 per cent to \$26m in the third quarter.

Firestone's shares rose by \$\% to \$24% in early trading on Wall Street

 DSM, the big Dutch state-owned chemical group, lifted first-half net income by 2.8 per cent to Fl 217m (\$94.2m) from Fl 211m a year earlier, AP-DJ reports from Heerlen.

Lower taxes, a decline in financing costs due to falling interest rates and a drop in outlays required by the company's restructuring programme mainly were responsible for the slight profit growth.

Soft markets in some of its business sectors as well as lower oil and petrochemical prices helped depress pre-tax operating income by almost 10 per cent to Fl 452m in the latest first half from FI 502m.

Turnover declined 18.6 per cent to Fi 11.18bn. The company said the negative effects of plunging world can bid for paper. energy prices on the valuation of its inventories was an important factor in its drop in pre-tax operating in-

Tuesday August 26 1986 Currency sector draws Eurobond investor interest

THE EUROBOND market saw a early last week. Apart from a genflurry of new issuing activity last week and syndicate managers should be kept busy over the coming weeks as a crop of deals, some for sovereign credits, are rumoured, writes Clare Pearson in London.

But the Eurodollar market seems unlikely to benefit from this surge in business. Investors' eyes are focused on the "currency" sectors of the market, despite the ambiguity of official statements out of Japan and West Germany on interest rate

policy.
The US, on the other hand, has already taken the plunge with a % point cut in the discount rate last Wednesday night. This move sur-prised but did not impress the Euro-

The cut came earlier than expected so the market did not have time to overrun itself in its anticipation. The hope of a further cut, however, is doing little to inspire dealers, given the flatness of the yield curve Operating income in the third which implies longer-term bonds may not benefit from it.

This view is of little help to un-

erously priced issue for Long-Term Credit Bank of Japan, most of these moved tortoise-like into the market. When a \$100m 10-year issue for Finland followed them in the after-

with a resounding chorus of indif-

The difficulty of inspiring Eurobond market investors to purchase dollar bonds is driving more borrowers into the relatively more buoyant New York debt market. This alternative has been favoured by US corporates for some time, but sovereigns are increasingly tapping it for longer-term funds.

Such stalwart Eurobond market uers as the World Bank, GMAC, Citicorp and Cigna are believed to have made the deliberate decision to issue in New York instead of going to Europe recently. There are rumours that Canada has been considering issuing in the Eurobond market for some time but has probably decided on the Yankee market

Meanwhile, in the sterling market a £150m bond for Britannia Building Society issued last Friday is expected to herald another crop of floating rate notes for UK building societies, with a very large issue ught likely to surface shortly.

The re-opened prospect of lower UK interest rates inspired a renewal of fixed-rate issuing activity in the sterling market last week, although the market came to grief last Thursday after the Bank of England had moved to quell pressure for an immediate cut in bank base lending rates. Nevertheless, by then Trafalgar

House, the UK construction, property and shipping concern, had been able to reopen the 20-year Eurosterling market, previously closed Trafalgar House's deal traded at

discounts to issue price within or around its fees despite a subseent downturn in the gilt market. derwriters of a rash of new, longer- But the "currency" sectors of the But it also demonstrated that the themselves with the outstanding dated Eurodollar deals launched Eurobond market should see a flock long-term Eurosterling market re- performance of equity related offer-

of new offerings soon. In the Euroyen mains firmly on shore. Its price leven market, for instance, a large deal from Norway is rumoured.

mains firmly on shore. Its price level was believed to have been sustained almost entirely by UK institutions, since continental investors continue to resist the prospect of a long-term sterling bond.

European investors are also reluctant to buy longer-dated Canadian dollar paper, dealers say. The 10year area of the Canadian dollar market is now heftily oversupplied. Some deals are being supported at price levels around their fees, but others were sinking fast by the end of last week.

Longer-term financings are far-ing better in the D-Mark sector, which is inspired by the hope that the currency may test DM 2 against the dollar and that official interest rates will eventually be cut. Although the domestic bond market is gaining the most from this anticipation, a 30-year Eurobond for the World Bank gained a point last

Recent fixed rate D-Mark deals have met mixed receptions, but underwriters should be able to console themselves with the outstanding

DM 150m 12-year bond for Kauthof, the department store group, hit a bid price of 137, 17 points up on the week. Meanwhile Benetton, the Italian clothing company, was able to launch a DM 200m bond at par on Tuesday that was bid at 119 by

Australian dollar bonds suffered a fresh burst of selling on Friday amid continuing negative reaction to the recent budget. Issues by Australian borrowers were particularly hard hit in the selling wave.

Thursday.

Peter Montagnon in London adds: Gota (UK), a unit of Sweden's Gotabanken, is to enter secondary market business in Eurobonds. It is hiring a team of three dealers headed by Mr Willy Breitschmid away from Thomson Mckinnon Se-

A feature of the move is that all three dealers - the other two are Mr Klaus Gerlach and Ms Heather Jackson - have a longstanding association, having worked together at the old firm of Ross & Partners before it was taken over by Drexel

erators. 'I would like to have seasoned traders who know what a bear market is in the next couple of vears." said Ms Annabelle Svedberg, Gota (UK) managing director. Properly staffed secondary market trading was an appropriate activity for a smaller house like Gota which could not for the time being aspire to a role in the primary market, she

EUROMARKET TURNOVER Turnover (\$m)

305.7 4,282.7 2,887.3 261.8 2,123.0 2,875.3 610.6 152.4 0.1 138.0 2,876.0 1,306.4 1,283.0 839.2 17,289.5 1,212.1 11,034.2 4,781.1 10,905.5 158.4 2,029.6 4,240.4 10,919.8 83.6 1,273.0 3,637.3

15,007.7 11,005.5 9,400.6 7,913.4 45,558.7 29,857.9 9,979.4

Innovative credit facility launched by British building society

BRITISH building societies have been stepping up their borrowing This is a conventional transferable activity in wholesale financial mar-revolving credit carrying a margin kets over the last couple of years, of 5 basis points over the London inbut they have not been particularly terbank offered rate for sterling denoted for their innovation. Last week, however, National and Provincial of Bradford launched a credit facility with a difference in the drawn sterling market, writes Peter Mon-tagnon in London.

Led by Lloyds Merchant Bank ances facility which carries no underwriting back-up and in which participants have an obligation to bid each time the borrower seeks to draw. The catch is that there is no

The deal is being handled separ-

posits and a commitment fee of 6 basis points payable only if less than two-thirds of the deal is

The margin is lower than on similar deals for other building societies but the borrower will absorb lenthe deal is a £100m, five-year adv- ders' costs of maintaining reserve assets with the Bank of England.

This deal is designed to be heavily drawn and will not back up the advances facility, which is reminis-cent of a dollar facility arranged for BAT Industries in the early days of the Euronote market. That operation also hore no commitment fee ately from another C100m, five-year and no maximum margins - and it facility for the same borrower that proved highly controversial.

National and Provincial's facility of the year varying between one will arouse the same degree of de- and three basis points depending bate, but one major change that has on the averaged weighted level of ommitment fee.

Lloyds described the structure on Friday as a half-way house between a committed facility and an uncomteed availability of funds because each participant is committed to bid for paper. But it cannot rely on obbe vulnerable to high rates if mar- ture. ket perception of its credit rating

To combat this a further twist has

It remains to be seen whether Banks will receive a fee at the end of 10 basis points, and drawings will vational and Provincial's facility of the year varying between one bear interest at a margin of 12½ baoccurred between the two deals is their bids for the paper. The highest that the market has become accusfee will be paid if the average bid tomed to fully uncommitted issues margin is less than 6 basis points, of commercial paper which carry no the lowest if it is between 9 and 12 and there will be no fee at all if it is higher than 12.

For the advances facility banks will have to absorb reserve asset mitted one. The borrower is guaran- costs themselves but Lloyds still reckons that the return to banks should be slightly higher when the bonus is taken into account than taining a particular price and would under a conventional facility struc-

Among other new deals Salomon Brothers is arranging a \$100m, fiveyear facility for Norwest Corporabeen introduced which Lloyds describes as a Christmas bonus. The deal carries a facility fee

NEW ISSUE

sis points though there will be an additional utilisation fee of 10 basis points if more than half is taken.

Separately, Lloyds announced on Friday that its bankers acceptance facility for the Soviet Foreign Trade Bank had been increased to £150m from £100 m.

The certificate of deposit programme for Mitsui Trust and Bankhas also been increased to \$1.5bn from \$1bn because of its successful market reception while Morgan Stanley and S.G. Warburg have been appointed as additional dealers alongside Shearson Lehman, Salomon Brothers and Paine Webber. Banco de Bilbao is launching a \$75m certificate of deposit facility through Bank of America, believed to be the first such operation

for a Spanish bank. Bankers Trust will also be a dealer. That leaves Asia as the main fo-

cus of activity in Eurocredits. As already reported, terms on Malaysia's \$350m deal were unveiled last week while Pakistan has agreed a 1 per cent margin on its five-year, \$100m credit led by Arab Banking, Chase Manhattan, Chemical and Gulf International Bank.

Bidding is now hotting up on the \$500m credit for India's Oil and Natural Gas Commission which is expecied to carry a strong Japanese tax-spared element following a growing trend in Asian deals. Though Korea has halted foreign

borrowing till the end of September, some bankers in Hong Kong reckon that Korea Development Bank could be back for its long-awaited \$300m deal shortly thereaf-

McLeod Young in search for investors

McLEOD Young Weir, one of Canada's largest investment banking and brokerage firms, is negotiating with several institutions wanting to buy a substantial interest in the

The Ontario Government is expected to ease the rules restricting outside ownership in brokerage firms by year-end, and McLeon wants a deal in place by then, said Mr Thomas Kierans, president.

Shearson Lehman Brothers, New York, part of American Express, already owns 10 per cent of McLeod, the maximum under prevailing rules. McLeod is talking to Shearson and two other Canadian institutions, but control will remain with the present senior management. The new outside ownership limit will be 30 per cent.

Wood Gundy and Gordon Capital, two large Canadian investment banks, this spring failed to find a basis for merger in advance of coming deregulation in the financial services industry while Dominion Securities is raising C\$100m (US\$72m) from the public.

Nesbitt Thomson also went the public issue route while several other brokerages have plans for increased foreign or Canadian institutional ownership.

Teleglobe Canada, the federal Government's next privatisation project, is still subject to policy changes and another round of bidding is likely.

The Government has competed

the sale of De Havilland to Boeing and Canadair to Bombardier and has disposed to an ammunition maker and several smaller crown units. But Teleglobe would be its biggest single privatisation step.

Ottawa originally asked for bids last year, and most proposals had expiry dates last October. Teleglobe handles Canada's foreign telecommunications traffic to all countries except the US and Mexico.

All these Notes having been sold, this announcement appears as a matter of record only.



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Freasury Rields

US MONEY AND CREDIT

Wall St. caught napping in week of surprises

Just as important in the Fed's

considerable pressure from the

—indeed, the announcement was immediately welcomed by

the White House—and the Republican congressional leader-

ship has also brought its fire power to bear on the Fed.

A COUPLE of surprises were sprung on the US credit markets last week, both of them providing some welcome elements of certainty after a period of drift and confusion. First came the unexpected downward revision of the second quarter gross national product (GNP) figures to a minimal 0.6 per cent, an outcome which contrasted sharply with the expectation of little change in the initial growth estimate of 1.1 per cent, Second, and more dramatic. was the immediate response of the Federal Reserve with a cut of half a percentage point in the discount rate to 5.5 per

mapping by the discount rate Fed would want to make quite move because it had been sure that the economy was not arguing that the Fed would heading up rapidly again before wait until well into September making its move. to confirm the way the economy was going. The hallmark of the US central bank under the chairmanship of Mr Paul Volcker has been its unwillingness to act in a precipitate manner to bring down rates, mainly because of Mr Volcker's preoccupation with the dangers reigniting inflation.

Many economists had contended that after three previous discount rate reductions already this year, the most revisions.

	Last	1 week	4 wks	—12-m	anth-
	Friday	eg o	#90	High	Lov
Fed Funds (weekly average)	6.14	6.31	6.37	9.91	6.1
Three-month Treesury bills	6.36	5.57	6.91	7.40	5.3
Six-month Treasury bills	5.43	5.53	5.69	7.48	5.4
Three-month prime CDs	5.70	6.00	6.33	8.10	5.8
30-day Commercial Paper	5.65	6.10	6.25	8.05	6.0
		-	6 <u>20</u> (%)	8.00	5.8
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US BOND PRICES Seven-year Treasury 20-year Treasury	AND Y Last Friday (102 117% 99%	TELDS (Change on week + 0% - 0% + 0% + 0% - 0% - 0% - 0% - 0%	(%) Vield 6.88 7.86 7.20	1 week *go 7.01 7.02 7.23	4 wide ago 7.2 7.9 7.4

Wall Street was caught recent only six weeks ago, the One explanation of the Fed's easing action hinges on the decisive steps in Washington towards tax reform, which.

according to some analysis may initially have a negative effect on the economy. Certain sectors of the construction industry, of the construction industry, for example, which has been one of the main motors for the expansion over the past three years, stand to lose quite heavily from the tax code

voted unanimously for the cut-and with a decisiveness which, says Mr Allen Sinai, chief economist at Shearson Lehman. amounts to a new strategy. The US central bank, he argues in his weekly bulletin, is now showing its willingness to go it alone in trying to revive the economy without the assur-ance of co-ordinated international action. It is accepting the risk of using reductions in the dollar's exchange rate flowing from lower rates to improve America's competitive position and out pressure on the US's trading partners to expand

decision, however, are the politics of the situation. Mr Volcker has clearly been under their economies.

Mr Sinal contends that the for this new approach because they showed that "the area most responsible for the ongoing weakness in the US economy and the key to stronger mouth real net exports showed. Administration to keep the momentum towards lower interest rates moving forward growth, real net exports, showed a greater deterioration than previously had been indicated ... the US economy cannot be restored to healthy, balanced Moreover, the composition of the Fed's board of governors has also changed rapidly this year to create a majority of Reagan Administration appoingrowth without an ment in trade."

The immediate market res-ponse to the Fed's announcement suggested that investors

tees and a bias of opinion see both towards easier monetary condi-tions, dangers in the policy of aggres-sive interest rate cuts.

> Early in the week, long-term rates had edged down, propelled by renewed indications of a weakening economy — indeed, some market participants argued that the yield on the 30-year Treasury long bond might be heading for the 7.10 range last seen in mid-July. On Monday and Tuesday, corporate treasurers jumped at this chance to refinance at lower long-term rates, bringing about \$2.8bn-worth of new issues to

the market in just two days. By the end of the week, everything looked different again. Yields at the long end of the interest rate spectrum headed back up as the market chewed over the inflationary risks of additional large declines in the

attractive to foreigners. At the same time, short-term rates eased back, propelled by a federal funds rate which fell by more than 30 basis points up to the end of the week to around 5.80 per cent Re Bridge

Federal Reserve Monetary Target

dollar, along with the difficulties of financing the budget and stood at 5.35 per cent against 5.60 per cent at the beginning, while on the Stock Exchange investors were showing sum-cient renewed optimism over trade deficits within a lower rate structure that was less growth to push the Dow Jones industrial average back towards the 1960 level.

lar. The DS Chreeky hanted lower, as expected, at the end of last week, but trading has been this throughout the dog days of August, and dealers believe that in a more dealers market the deliar could sauly slip below DM2 (against the pre-cent DM2.043) and Yen 150 The question left hanging over the market this week is the longer term reaction of the dol-(against 153.40).

Terry Dodsworth

lar. The US currency drifted



Hint of an auction system for securities

THE BONES sketched by the Bank of England in its paper on the future structure of the gilts market always carried the hint of a partial move towards the auction system for selling gilt-edged securities.

"One possibility which the Bank will wish to examine is whether some part at least of the funding programme might be put on a more regular foot-ing, with greater reliance on the imary market. The Bank will in due course wish to discuss this possibility with the market makers, including in that context managements to ensure their appropriate support of the primary offerings," the Bank said last April.

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of H Usag conti ties rarel of ti with While detailed discussions appear likely to be left until 27 primary dealers have recovered from the emotional stress of "Big Bang" and have settled fully into the new market structure, the message is now reaching the market that the authorities are planning an

three or four auctions to test the water.

The shorter end of the conventional market is candidate for the first auction, followed possibly by alternative long and short auctions. Shorter maturities are thought to suffer less from the danger that the imminence of the auction itself will depress prices—as has happened on numerous occasions with the US Treasury bond

success of the trial auctions will be a commitment from the authorities not to issue more stock of the same type within a specified period.

It is clear that an auction system would not have worked in the current gilts market, and it might appear by corollary that the tap system will not be practicable in the new mar-ket structure. Mr Paul Temperton, economist at Merrill Lynch, calculates that the current job-

of capital whereas the 27 new market makers will have around to bid for and hold stock.

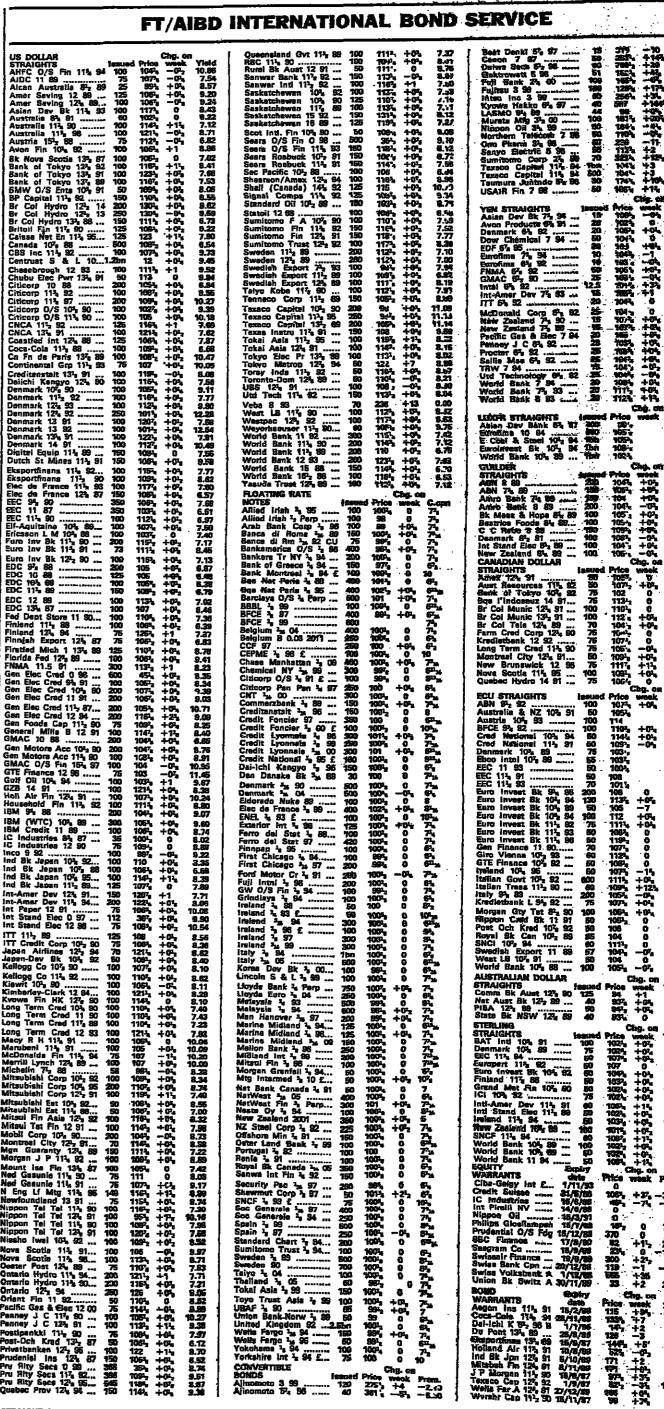
"One can envisage circumstances in which, say, following a general rise in the market all 27 primary dealers wish to be supplied with a tap stock by the Bank of England," Mr Temper-ton says. "Given limited supply, it would be difficult for all Meanwhile, the market will of the primary dealers to be have to cope with £500m of new In a case like this, it is expec-

ted that the Bank would, in effect, conduct an informal tender, combining an auction with some element of rationing. The authorities are keen to make stock available to anyone who has independently decided to take a position, but equally they are willing to call a temporary halt if all the dealers are responding to the same Very light, such as a monetary statistic. The auction system offers the

experimental series of perhaps bing system has around £100m advantage of regularity, both to the borrower and to the inves-tor. It might, perhaps, help to £700m between them, and so avoid the periodic panics that will have much greater capacity occur when the market decides that the Government is getting behind in its funding pro-gramme. It could as an added bonus serve to iron out some of the wrinkles that the public sector borrowing requirement puts into the monetary aggre-

> Meanwhile, the market will from 1990 to 2002. The stock is loan, which offers bearer form and tax-free status for overseas investors, £150m of 10 per cent conversion 1996 and the same amount of 92 per cent Treasury 2002. The National Debt Commissioners are also taking on £100m of 11 per cent Exchequer 1989 and £100m of 101 per cent

George Graham





All of these Securities have been sold. This announcement appears as a matter of record only.

U.S. \$100,000,000

Australian Industry Development Corporation

83/8% Bonds Due 1996

MORGAN STANLEY INTERNATIONAL

SALOMON BROTHERS INTERNATIONAL

BANK OF TOKYO INTERNATIONAL Limited

BANQUE BRUXELLES LAMBERT S.A.

BANQUE NATIONALE DE PARIS

COUNTY NATWEST CAPITAL MARKETS

CREDIT SUISSE FIRST BOSTON

DAIWA EUROPE LIMITED

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NOMURA INTERNATIONAL Limited

ORION ROYAL BANK

S.G. WARBURG & CO. LTD.

August 26, 1986

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INTERNATIONAL CAPITAL MARKETS AND COMPANIES

Laura Raun on the strategy behind a rare Dutch takeover attempt

Unilever smells success in Naarden move

WHILE dramatic and costly takeovers of British and American companies have accelerated in recent years, far fewer Dutch companies have been snagged. The relative scarcity of Dutch takeovers makes Unilever's friendly and increasingly likely takeover of common shares for non-voting share certificates and issue of interesting.

Unilever, the Anglo-Dutch flavours and fragrances group, even more interesting.

Unilever, the Anglo-Dutch flood and detergents conglomerate, looks set to go ahead in companies weeks with its contemporary because they will be invoked only if the meeting of American derived from merging of the concern. Although of the

unilever, the Anglo-Dutch food and detergents conglomerate, looks set to go ahead in coming weeks with its contemplated public bid for the rest of Naarden that it does not already own. Negotiations over the mooted Fl 90 a share offer have continued even while Unilever has snapped up Naarden's shares. Yesterday Unilever said it had boosted its stake from 40 per cent to 49 per cent and said talks were going well. Under Dutch law, Unilever is not permitted to acquire more than 50 per cent of Naarden shares on the open market.

Naarden executives and shareholders heartly welcomed the still top priority. But both computer the still top priority gut the still top priority. But both computer the still top priority gut the still top priority. But both computer the still top priority gut the still top priority gut the still top priority. But both computer the store that the still top priority gut the still top priority. But both computer the store that the still top priority gut the still top priority gut the still top priority. But both computer the store that the still top priority gut the still top priority gut the still top priority gut the still top priority. But both computer the store that the still top priority gut the still top priority gut the still top priority. But both computer the store that the still the stil

shareholders heartily welcomed still top priority. But both com- shares some years ago in an Unilever's advances during an panies apparently expect to attempt to preserve some family

rather than taking instructions from a headquarters elsewhere. Part of this independence arises from the Dutch character and its very high premium on individual freedom.

Family - owned companies often have carefully protected their integrity, avoiding going public entirely or ensuring firm control. The Heim family re-

control. The Heijn family re-tains some control over Ahold. the food-chain concern, through
preference shares in a foundation, somewhat similar to
Grundig of West Germany.
Douwe Egberts, the coffee
add tobacco company, issued B

point in negotiations with Uni-lever. As a Naarden executive emphatically put it: "We're not interested in asset-strippers like some of the American com-panies."

Many Dutch companies already boast large operations abroad and export heavily, obviating the need to merge

the sort of companies that make cent of Neunion members fear for their legally car jobs. Management's desire to labour cokeep workers happy has more to do with the Dutch desire indicated.

tions are a poor way to start a new venture and so all sides want an acceptable solution. No job guarantees have been made but the executive added that the "social aspects" are very im-

small, domestic

small, domestic

social aspects " are very important to an agreement with Unilever.

Yet another factor is the great weight which Dutch managers give to labour relations. Asset-strippers are just the sort of companies that make union members feer in the second strippers are just the sort of companies that make union members feer in the second strippers are just the sort of companies that make union members feer in the social aspects " are very important to an agreement with Unilever.

With Naarden's share price having surged to around F195, against F154 before Unilever announced its plans, a competing bid cannot be ruled out. A higher bid for the second strippers are very important to an agreement with Unilever.

With Naarden's share price having surged to around F195, against F154 before Unilever announced its plans, a competing to the second strippers are very important to an agreement with Unilever.

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With Naarden's share price having surged to around F195, against F154 before Unilever announced its plans, a competing to the second strippers are very important to an agreement with Unilever. legally cannot buy plus better labour conditions would not be rejected either. Naarden

Group Five turnover falls 20%

NEW INTERNATIONAL BOND ISSUES

hannesburg.

The company continued to suffer operating losses and has closed down several loss-making divisions.

The company continued to suffer against last year's R12m interim pre-tax loss was R11m on the construction and civil engineering sectors.

The first half has resulted in a loss of 71.8 cents a share

GROUP FIVE, one of South Africa's larger construction companies, suffered a 20 per cent decline in turnover during the first half of the year over during the first half of the year of the year over during the first half of the year of the year over during the first half of the year over during the first half of the year of the year over during the first half of the year over during the first half of the year of the year over during the first half of the year over during the first h over during the first half of the year as the number of contracts available shrank, writes Jim Jones in Jo-

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*Not yet priced. ‡ Final terms. ** Private placement. § Convertible. † Floating rate notes. ¶ With equity warrants. ∮ With bord warrants. B Currency linked. (a) Parthy-paid. (b) ¾16 over 3m Libor. (c) Reverse FRN; linked to yes 6m Libor, last 5yrs becomes frond rate issue paying 8 per cent. (d) Equal to 6m Libor. (e) Lemmined on US domestic market. (f) ∀16 over 3m Libor. (g) 10bp over 3m Libor. (h) Additional SwFrs 150m maximum en tep. (j) Equal to 6m Limena. (k) Convertible into stock or gold. Note: Yields are calculated on ASSO basis.

Elkem slides further into the red at six months

BY FAY GJESTER IN OSLO

ELKEM, the Norwegian metals, market situation, there was no mining and manufacturing inventory build-up during the concern, reports a further first half. Elkem's finished

—aluminium, silicon and ferro alloys—coupled with the effects of a week-long industrial disput in April.

The 10 April.

The 12 per cent devaluation vestigating unusual movements of the Norwegian krone in May in the price of Kvaerner's shares had an immediate negative just ahead of the purchase. impact on Elkem's accounts, by boosting financial costs. However, it also increases kroner income from exports, and over the year as a whole this is expected to offset the initial rise in financial costs.

The report says that there are still no signs of a likely congral price improvement for the interval of the inte impact on Elkem's accounts, by

coneral price improvement for "areus 13d 081 INN 10 3011d Sur 29 per cent in the first half to the metals it produces, but This is NKr 8 per share less notes that, despite the difficult than Elkem reportedly paid.

deterion of results in the second quarter of 1988, bringing group losses for the half-year to NKr 98m (\$13.4), compared with a profit, before extraordinary items, of NKr 258m a year earlier.

Turnover dropped to NKr 3.7bn, from NKr 4.74bn, reflecting continuing low prices for the group's main products

—aluminium, silicon and ferro

vestigating unusual movements Mr Erik Jarve, stock exchange

Interim profits setback at Beijer

INVESTMENT BELIER, the Swedish diversified holding company, said pre-tax profits fell 20 per cent to SKr 197m (\$28.6m) in the first half of 1986 from SKr 247m a year earlier, APDJ reports from Stockholm.

Despite a 38.4 per cent increase in the general stock market index, its portfolio of listed shares only increased 19.6 per cent during the period because of a steep drop in the share price of Fermenta, the biotechnology company. The market value of Beijer's port-The folio rose to SKr 3.32bn at the end of June from SKr 2.82bn at the beginning of the year.

For the full year, Beijer forecast that pre-tax profits would fall to SKr 250m from SKr 435m in 1985. The forecast was adjusted upwards from expectations of a SKr 180m fullyear profit stated in May.

Beijer group sales increased

Fruehauf agrees \$1.12bn Merrill Lynch-led buyout

BY PAUL TAYLOR IN NEW YORK

Fruehauf's senior managers. pany with a package of As a part of the deal, which securities with a face value of came after two days of intense \$51 a share.

man expenses. of securities, including pre-ferred and common stock, which analysts valued at about \$48.75 Earlier Merrill Lynch had

THE five-month long battle for been offering \$48.50 in cash and control of Fruehauf, the US securities for Fruehauf while automotive parts and truck the Edelman group had company, ended with the Detroit group agreeing to a sweetened bid battle with a complex \$1.12bn leveraged buy-out bid still with a complex S1.12bn leveraged buy-out bid led by Merrill Lyach, the Wall Street securities firm, and acquiring the rest of the company.

came after two days of intense negotiations, another investor group led by Mr Asher B. Edelman, dropped its hostile counter bid but will emerge from the battle with a large profit. As part of the deal the Merrill Lynch-led group agreed to acquire the 2.1m shares accumulated by the Edelman group for \$49 a share, representing a profit of about \$30m, and to reimburse \$21m in Edelman are expenses.

\$51 a share

The deal signals the end of a long and sometimes bittle for control of Fruehauf, which began in March. Once the buyout is complete, Fruehauf is expected to shed some of its assets, perhaps its aerospace and finance subsidiaries, to help pay back debt.

6 Anderson, Clayton, the US food group which has rejected a bid from Bear Stearns and Guss & Co, two US investment nan expenses.

Guss & Co, two US investment
The Merrill Lynch-led group banks, is commencing a tender will pay shareholders \$49.50 a offer to buy up to 8m of its share in cash for 71 per cent of outstanding common shares at Fruehauf and acquire the S60 each in cash, for a local or remaining shares with a package S480m. This represents a S24m increase over the cash distribution of the stockholders tion to public stockholders involved in the company's now withdrawn recapitalisation plan.

This announcement appears as a matter of record only.

AUGUST 1986

U.S. \$55,000,000



Great American Credit Services, Inc.

Revolving Credit Facility

Great American First Savings Bank

Credit Suisse First Boston Limited

Participants

Banco de Bilbao S.A.

The Bank of Tokyo, Ltd.

Banque Nationale de Paris

Bank Brussel Lambert N.V.

Banque Paribas

Crédit Agricole

Crédit du Nord

First Interstate Capital Markets Limited

Kansallis Banking Group

National Australia Bank

The Sanwa Bank, Ltd.

Fucility Agent

Credit Suisse First Boston Limited

This announcement appears as a matter of record only.

7th May, 1986

U.S. \$100,000,000



Union Pacific Corporation

7% per cent. Notes due 1996.

Issue Price 99¾ per cent.

Union Bank of Switzerland (Securities) Limited

Bank of Tokyo International Limited

Banque Bruxelles Lambert S.A.

Barclays Merchant Bank Limited

Chemical Bank International Limited

Crédit Commercial de France

Crédit Lyonnais

Daiwa Europe Limited

Deutsche Bank Capital Markets Limited

Kuwait Investment Company (S.A.K.)

Generale Bank

Kleinwort, Benson Limited

IBJ International Limited

Kuwait International Investment Co. s.a.k.

Kredietbank International Group

Morgan Grenfell & Co. Limited

Morgan Guaranty Ltd

The National Commercial Bank-Jeddah

The Nikko Securities Co., (Europe) Ltd.

Banca del Gottardo

Genossenschaftliche Zentralbank AG-Vienna

Leu Securities Limited

Swiss Volksbank

Standard

Chartered

Press reports that the Austra

and had "little credibility,"

according to Mr Michael McWilliam, Standard's group

managing director.

Mr McWilliam said yesterday

planned bid, and it seemed an

implausible idea bearing in mind the respective sizes of

the two groups and the present weakness of the Australian

At the moment Australian banks generally were not in a good position to do anything

overseas since their main prob-lem was coping with their weak

domestic currency. So the story made little sense, he added.

Sirdar, the hand-knitting yarn

maker, has moved into the manufacture of ready made curtains through the acquisition

of Eversure Textiles for an initial £6m cash.

Sirdar moves

into curtain

making

dollar.

dismisses

bid talk

By John Edwards

BY RICHARD TOMXINS

Yorkshire Television, the £3.6m last time, putting the count to the average for last of the major television shares on a prospective price/ Thames, Central and LWT. Yorkshire Television, contractors to seek a stock offer for sale which will value

Some 8.2m shares - 25 per cent of the equity — are being sold at 125p a share by the company's four major share-holders. These are Bass, W. H. Smith, PL Publishing (2 subsidiary of Pearson, which also owns the Financial Times) and Yorkshire Post News-

Brothers. merchant bank, is sponsoring the issue and Cazenove is the

Yorkshire is coming to the market on a profits forecast of £8.25m for the year to September 30 1936, compared

Network Security profit doubled

Network Security Corpora-tion, the 26.5 per cent owned associate of Automated Security (Holdings), has announced in-

terim profits more than doubled at \$4.7m (£3.1m) against \$2.2m on turnover of \$30.3m,

The directors said that the company performed soundly. The period included the public issue of shares in its sub-sidiary Interactive Technolo-gies and the issue of \$20m of convertible loan stock to replace existing debt.

earnings multiple of 8.4. On market quotation, today pub-lishes the prospectus for an the yield will be 7.04 per cent.

Authority for programmes such as First Tuesday, From The Cradle To The Grave, Harry's Game, and The Beiderbecke Affair

o comment

the new issues market seems to The prospectus also high-lights Yorkshire's programme-making record and draws attention to praise from the danger that holiday-making attention to praise from the Independent Broadcasting cheque books at home, the heavy oversubscriptions for Thames and TV-am suggests that there is enough pent-up demand for cheap television stocks to see Yorkshire off to a good start. There are, of course, reservations: television adver-Simple mathematics dictates tising revenue is not going to that if there is any logic in the rise at today's rates for ever, stock market at all, Yorkshire and Yorkshire might somehow Television's issue must be a success. There is little to disting the same arguments arguments.

Holographics expansion plan

At the annual meeting of informed that the company was Applied Helographies the in the advanced stage of the chairman confirmed that production of folls was set to start next February.

Transfer-All Purpose Folls, the company jointly set up with Transfer Print Folls, had formally received an offer of companies in the UK Switzer-

the company jointly set up with Transfer Print Foils, had formally received an offer of grants totalling £1.4m from the Department of Trade. That would create some 130 jobs over the next two years in Washington, Tyne and Wear,

SHEPPARDS, PELLY, PRICE & POTT

For 159 years we've been searching

for the perfect name. Now the chase is off.

just edited highlights.) However, as people insist on calling us by our

first name only, we thought we'd bow to their judgement and make

Contact us at the address below, and we could get even better acquainted. Sheppards

No. 1 London Bridge, London SE1 9QU. Telephone: 01-378 7000. Telex: 888282. Fax: 01-378 7585.

A Member of The Stock Exchange.

NOTICE OF CALL AND REDEMPTION

To the Holders of

The Bank of Tokyo, Ltd., Portland Branch

US\$10,000,000 Callable Negotiable Floating Rate

Certificates of Deposit due December 9, 1986 (the "Certificates")

Notice is hereby given that, pursuant to the provisions of the Certificates, The Bank of Tokyo, Ltd., Portland Branch ("the Bank") will prepay the outstanding principal amount of the Certificates identified below in full on September 9, 1995, the next interest Payment Date, together with the interest accrued to that date. Payment will be made against presentation and surrender of said Certificates at The Bank of Tokyo Trust Company at 100 Broadway, New York, NY 10005. The Certificates being called are as follows:

The Bank of Tokyo, Ltd., Portland Branch, 411 SW 6th, Portland, Oregon, 97204

Principal Amount

\$1,000,000

it official. From today, we will be known simply as Sheppards.

We've been called some curious things in our time. (These are

Shareholders were also institutions.

success. There is little to distinguish the company from the other ITV majors, yet the issue p/e of 10.9 and offering an identical yield: and look what hapleaves it at a significant dispensed to that.

companies in the UK, Switzer land and the US. Orders for the standard embossed holograms for plastic

Sirdar considers the acquisi-tion will contribute significantly to future growth. It is intended to expand the Eversure product cards had already been received from various financial and other range, and growth in the demand for own label products from certain principal retail customers is also anticipated. Eversure has been acquired from the directors and employees, and principal share-holder Mr David Wosskow is staying on as chief executive. The executive directors are to remain and will be joined by Mr F. G. Lumb and Mr J. Stuart

of Sirdar. In the four years ended March 31 1986 Eversure lifted its turnover from £8.1m to £11.65m, and its profit before tax from £49,000 to £808,000. Certain charges will not recur in future after completion; in 1985-86 they came to £70,000. Net tangible assets were

Further consideration is pay-able dependent on profits over the next two years.

Arthur Wood in profit

A considerable improvement in demand enabled Arthur Wood & Son (Longport) to re-turn to the black in the first and produce a profit of The group, maker of fancy

earthenware, teapots and beakers, said it was expecting an iners, said it was expecting an increase for the year over the previous £140,000, provided order books stayed at their present satisfactory level.

In the 1985 half year the group incurred a loss of £11,200 (profit £168,000) but showed a profit of £151,000 (£282,000) in the traditionally better second half.

Turnover in the 1985 period

Turnover in the 1986 period came to £2m (£1.72m). After tax £21,300 (nil) earnings were shown at 1.56p (loss 0.63p) per

F.T. Share Information The following securities have been added to the Share Information Services:

Airsprung

(Sertion: Industrials)

Alrspring
(Section: Industrials)
Campbell & Armstrong
(Industrials)
Kleinwort Development Fund
(Investment Trusts)
Nationwide Bd. Soc. 104e, 27-7-87
(Loans, Building Societies)
Space Planning Services
(Paper, Printing & Advertising)
Tibbett & Britten
(Drapery & Stores)

To the Holders of SOUTH CAROLINA

NATIONAL CORPORATION 62% Convertible Subordinated Debentures the 2011
NOTICE IS HEREBY GIVEN that a twofor-one stock split was approved on July
21. 1986 by the Board of Directors of
South Carolina National Corporation. The
split will be effected in the form of a 100
percent common stock dividend and will
be paid on October 1. 1986, to shareholders of record on September 10, 1986.

SOUTH CAROLINA NATIONAL CORPORATION

£85,000,000

Total Number of Certificates Redeemed

(Nos PT 6976-PT 8985)



Floating Rate Notes Due 1991

Interest Rate

issue Date March 9, 1983

97/8% per annum

Interest Period

21st August 1986 21st November 1986

Interest Amount per £5,000 Note due

21st November 1986 £124,45

> Credit Suisse First Boston Limited Agent Bank

U.S. \$150,000,000

Chemical **New York Corporation**

Floating Rate Subordinated Notes Due 1996

Interest Accrual Interest Amount per U.S. \$10,000 Note due 8th September 1986

Aggregate Principal Amount

27th May 1986 28th August 1986

U.S. \$175,00 Credit Suisse First Boston Limited Agent Bank

Ayrshire Metal improving after £0.3m interim loss

Reflecting depressed condi-tions throughout most of the tion group said they carried out first half of 1986, the results of a critical appraisal of the cost Ayrshire Metal Products showed structure and that led to a 10 a downturn of £725,000 to a loss of £299,000. The directors halved the

lian banking group Westpac was planning a take-over hid for Standard Chartered Bank were "entirely speculative" interim dividend to 0.5p net and said the full year's payment would be considered on the basis of the second half per-formance. In the year 1985 the group made a profit of £760,000 that he had no evidence of any

of the companies' operations, viding forecasting remained difficult, profits.

per cent reduction in numbers employed and annual cost savings in excess of £400,000.
The industrial built buildings

market, served by the Daventry company, was showing signs of increased activity after the downturn last autumn. At St Helens the factory was and paid a final of 1p.

With short lead times at each of the companies operations, viding lower than anticipated

the directors said. But at the end of July the group was operating at a modest profit.

The directors of this light profits.

Sales in the 24 weeks ended June 13 1986 came to £8.34m (£9m) with the UK contribution down to £7.99m (£8.68m).

BOARD MEETINGS

DUANU I
TODAY Interime:—American Trust. William Bedford, Botawana RST, Cambridge Electronic Industries, I. J. Dewhirst, Edinburgh Fund Managers, Ex-Lands, Gold and Base Metal Mines, Hongkorg and Shanghai Banking, Marley, Ryan International, Taylor Woodrow, Temple- ton Gaibraith and Hanabarger, Tenby Industries, Wessanen. Final:—Randsworth Trust. FUTURE DATES

Final:—Randsworth Trust. FUTURE DATES		
Interims:— Abbay Panels	Sept Sept	•

st, is, ng an le- by	Peninsular and Oriental Steam Navigation Steel Burrit Jones Stawart Wrightson United Newspapers Wates City of London Props. Williams Holdings Young and Co's Brewery Finals.—	Ser Ser Ser No
9	BenchmarkClarka Hoops:	Se; Se;

Oil and Gas

Technology Projects European Community Funding

Funds are available from the Commission of the European Community for projects which promote new technology in exploration, production, transport or storage of oil and gas. The monies become repayable only if the project is exploited commercially and may cover up to 40% of the total cost. Interest is payable only on amounts outstanding after commercial exploitation.

The closing date for the next round of the Scheme is 28 November, 1986.

For a free booklet designed to help British companies seeking funds under the Community Technological Development Projects in the Hydrocarbons Sector Scheme, simply post the coupon; or telephone Mr J. Drummond of the Offshore Supplies Office on 041-221 8777 ext. 488.

Please send me the tree booklet about funds avoilable under the Community Technological Development Project in the Hydrocarbons Sector Scheme.

Company.

Post to: Mr. J. Drummond. Ref. F 26/8, Offshore Supplies Office, Alhambra House, 45 Waterloo Street, Glascow G2 6AS

EDFV

Electricité de France

US\$300,000,000 Floating Rate Notes due 1997 with Warrants permitting exchange of Notes for ECU-denominated 934% Bonds due 1995

Notes and Bonds unconditionally guaranteed by

THE REPUBLIC OF FRANCE

For the period 21st March 1986 to 26th September 1986 the interest amount will be US\$350.01 per US\$10,000 note, payable on 26th September 1986.

Bankers Trust Company London,

LADBROKE INDEX

1,271-1,277 (+4)

Based on FT Index

Tel: 01-427 4411

Agent Bank

GRANVILLE

Granville & Co. Umited 8 Lovat Lane London EC3R 8BP Telephone 01-621 1212 Member of Fimbre

Change Gross Yield Fully
Price on week div.(p) % Actual taxed
132 — 7.3 5.5 8.1 7.5
131 — 10.0 7.6 — —
108 — 7.8 7.0 6.8 6.0
38 +1 4.3 11.9 4.4 6.4
184 — 4.6 2.5 20,9 19.2
79 —1 4.3 5.4 9.4 8.8
85 +2 2.9 3.4 6.0 8.4
86 — 15.7 18.3 — —
237 +2 9.1 3.8 11.4 11.7
93 +1 10.7 11.5 — —
77 +5 7.0 9.1 8.0 10.5 Ass. Brit. Ind. Ord. ...
Ass. Brit. Ind. CULS...
Airsprung Group ...
Armitage and Rhodes...
Bardon Hill
CCL Ordinary
CCL 11pc Conv. Pl. ...
Carborundum Ord.
Carborundum 7.5pc Pl.

Carborundum 7.5pc Pf.
Deborah Services
Frederick Perker Group
George Blair
Ind. Precision Castings
leis Group
Jenes Burrough PpcPf.
John Howard Group
Multihouse My
Racord Ridgway Ord...
Racord Ridgway Ord...
Racord Ridgway Ord...
Torday and Carlisle
Trevien Holdings
Unilock Holdings
Watter Alexander
W. S. Yeetes 3.8 3.0 15.0 17.0 12.9 12.9 14.1 5.7 7.9 2.8 87.4

PENDING DIVIDENDS

Dates when some of the more important company dividend statements may be expected in the next few weeks are given in the following table. The dates shown are those of last year's announcements except where the forthcoming board meetings (indicated thus") have been officially notified. Dividends to be declared will not necessarily be at the amounts in the column headed "Announcement last year."

. Turonncement 133	t year.		
Date	Announce- ment last year	Dette	Announce- ment last year
AMECAUB 25	iatarim 4.0	Legal and GeneralSept 16	tionerism & K
Aseod Brit PortsSept 11	interim 1.9	Lond Merchent	· ·
BAT IndustaSept 10	Interim 4.75	SecuritiesSept 10	Final 1.5
BCIAug 27	teterim 6.0	*Love and	
BICCSept 10	Interim 3.5	BovetSept 3	Interior 3.8
BPAug 28	Interim 12.0	MATSept 28	First 12
BTRSept 11	Interim 3.75	*McAicine	
Babcock IntlSept 4	interim 4.0	(A.)Sept 9	Interio 3.0
Bank of		StarleyAug 27	interim 1.4
ScotlandSept 25 Berrett	interim 5.5	"Menzies (J.)Sept 29	insertin 1:35
DevelomtsSept 24	Final 5.31	"Metal Closures, Sept 3	Interim 2.2
Blue Circle	Lindi 5491	Morgan	.tarbernit. ever
IndustriesAug 27	Interim dae	GrucibleSept 12	Interim 3.6
BookerSept 11	Interim 4.25	*Pearl Asses Aug 27	Sectority 18 28
BowaterSept 11	Insprim 3.75	PermonSection	Interio 4.25
Brent ChemaSept 16	interial 0.85	PeersonSept: 9	Interim 8.0
Britannia	1	Pentiend	
ArrowAug 28 British	Interior 1.2	IndustriesAdv. 28	Interior C.64
AntohpaceAug 30	Interim 5.8	*PrudentialSept 10	TO CHAMP ST
British Vita Sept 9	Interim 3.3	RMCSept 25	Interim 4.8
Brixton		"Ransomas	Interim 7.5
EstateSept 18	leterin 23	SimeSept 15	The sale 1's
Brown Boverl Sept 19	interim 1.0	Coloner Sept 11	Interior 6.0
BunziSept 4	Interim 4.25	Rio Tinto-	
Burmah OilSept 12 Cadbury	1/REFIRE 9.0	ZîncSept 25	interim 7
SchwappesSept 5	interim 1.6	Roventres	
Cement	17-241231 114	Mackintosh,Sept 19	Interim 4.0
RoadstoneSept 4	Interim 1.15	Sime DarbySept 2	Final 5.8 sen.
Costs Patons Sept 17	luterim 1.9	Simon EngSept 15	terrecion 2.6
Combined Eng StoresSept 23	Loterim 2.45	EstatueAug 27	Interim 2:2
Cons Gold	Militarini 1742	SteetleySept 24	Interin 5
FieldsSent 16	Final 16.0	*Stewart	
Cookson ,Sept 5	Interim 2.4	WrightsonSept 15	Interim 5.3
:08tam	interim 6.0	"Sun AfrianceSept 3 TarmecSept 16	interim 6.75 . locarin: 2.2
Crode IntlSept 18 ORGSept 24	Interim 3.0 Interim 3.3	Taylor	144001100 0000
PalgetySept 16	Final 14.0	WoodrowAug 26	Interior 4.0
3eltsSept 13	Interin: 2,35	Travis and	
nterprise Oil Sept 16 uro FerriesSept 11	laterim 3.5	Amold, Sept 17	interim 1,85
uro FerriesSept 11	interim 1.1	Tomer and NewsiiSept 12	Interim 1.35
xpamet intlSept 10 ixco intlSept 2	Interim 2.35 Interim 1.6	Utd BiscuitsSept 12	Interior 2.85
Risons ,Sept 17	Interim 2.16	*United	
oseco		NewspapersStor 25	interior dus
MinsepSect 27	leterim 2.95	VickersSept 25	. Intellien 6
reemensSept 23	interim 2.3	Wates City of	
lepworth	t	Lond PropeSept 3 *WeirAbb 27	interim due Interim 0.75
CeremicSept 11	Interim 2.9 Interim 1.2	*Williams	
IK Shanohai	***************************************	HoldingsSept 1	interior due
Real Aug 78	Interim \$0.15	Willis Faber Sept 10	Interim 5.0
MISept 2 asmoSept 3 adbrokeAug 29 aing (J.)Sept 12	Interim 2.2	Willis Faber Sept 10 Wilnpey (G.) Sept 25	Interior 0.86
sept 3	Interim 4.5	WoolworthSept 18	leterire 3.0 -
adbrokaAug 29	Interim 5.0 Interim 2.0	Daniel market later	-
5,000 (J.)	interim 2.0 Interim 2.4	Popul program program 1 Tav	tone. E Bertin
aint	Interim 3.2	*Board maxing Intime Izane since made. \$ Tax izane since made. \$ For	SCARL .

COMPANY NEWS IN BRIEF

ROCKWOOD HOLDING'S training courses, creates film 2.37m rights issue at 35p per and video sales and training share has been taken up as to programmes. Exercise of the 2.35m (about 99.2 per cent). £80,000 option will be no later This includes the rights of W. than March 31, 1987. Canning, its holding company, to 2.03m which were taken up to 2.03m which were taken up by a group of investors. The balance has been sold at 60p per share, and the proceeds will be distributed among the original allottees who have not taken up their rights. The shares are traded on the USM.

CIRCLE Southern BLUE CIRCLE Southern
Cement, associate of Bine
Circle Industries, reported sales
in the first six months of 1986
of A\$135.69m (£55.34m), up
from A\$113.55m to give pre-fix
profits of A\$33.22m (A\$23.46m).
The interim dividend is raised
from 5 cents to 7 cents.

NATIONWIDE LEISURE has acquired Lakeview Mobile Home Park near Romford, Essex, for film cash from London Park Homes. The purchase comprises freehold land and buildings, valued at £817,000 and goodwill of £187,000. Lake-view Park Home Estates, as it will be called, is undergoing major redevelopment.

EAST RAND Consolidated re-ported lower taxable profits of \$255,000 against \$200,000 for

major redevelopment. ported lower taxable profits of £285,000, against £309,900, for first six months of 1986. Earnmunications has entered an ings per share were 0.75p option agreement to buy 50 per (1.01p). The company does not cent of DRL, which provides pay interim dividends.

Joseph Webb—Ewart New Northern purchased 2,289,160 Ordinary on Aug 20 (8.9 per

cent).

Samuelsen Group — As a result of further purchases of 25,000 Ordinary each, Mr S. W. Samuelson now beneficially owns 523,792, Mr J. W. Samuelson 1,292,044, and Mr P. W.

SHARE STAKES Changes in company share chased 1m ordinary bringing stakes announced over the past total holdings to 1,125,000 week include: (6.979 per cent).

GRAIG SHIPPING has proposed to its shareholders that it be allowed to purchase its own shares, up to a maximum of 180,000 ordinary and 40,000 to non-voting shares acquire-

A non-voting shares, equiva-lent to 10 per cent of its issued share capital. Although the

plans to exercise such powers, they have asked shareholders

to give them the authority to

OFSTON ESTATE Agency's offer for Midland Marts is unconditional in all respects and remains open. At the first clos-

ing date acceptances had been received in respect of 74 per

cent of the shares, giving Oyston a total holding of 89.8 per cent.

HIGGS AND HILL's offer for

the Southend Estates Group has

declared unconditions

NEY MAR

Lack Children

Cap Group — Charterhouse Development Capital Fund sold 500,000 ordinary reducing aggregate holding from 6.95 per cent to 5.58 per cent.

Polly Peck Intal—Legal and General Assurance acquired a further 50,000 Ordinary to bring total to 5,461,060 (5.03%). Som 1,282,042, and mr F. W.

Samuelson 1,086,190.

Renters — Nelson

Trust, established by M. E.

Nelson, director, sold 17,500 further 62,500 shares, and each

"B" limited voting shares at hold 3,596,867 (14.26%).

Mitchell Somers—Coast Investment and Development Company of Kuwait has pur-

Kingdom of Spain

U.S. \$375,000,000 Floating Rate Notes Due 2005

Holders of Notes of the above issue are hereby notified that for the final Interest Sub-period from 26th August, 1986 to 22nd September, 1986 the following will apply: Interest Payment Date: 22nd September, 1986

2. Rate of Interest for Sub-period: Interest Amount payable for Sub-period:

6% per annum US\$ 45.00 per USS 10,000 nominal

4. Accumulated interest Amount payable:

per US\$ 250,000 nominal US\$ 352,56 per US\$ 10,000 nominal US\$ 8,813.81

USS 1,125.00

per US\$ 250,000 nominal

Bank of America International Limited

FINANCIAL TIMES STOCK INDIC

	August 22	Angust 21	Angust 20	August 19	August 18	Atignst 15	19 High	S6 Low	Stace Co	
Government Sets	89.54	89.85	89.93	89.62	89.29	89.29	94.51	80,39		
Fixed Interest	95.72	95.81	95.83	95.54	95.46	95.48	97.68	86.55	127,4	
Ordinary	1271.2	1267.1	1268.4	1267.8	1273.6	1271.0	1425.9		150.4	50.
Gold Mines	235.9	226.9	222.5	219.0	224.9	229.6		1094.3		49
FT-Aid Ali Stare	794.23	794.89	792.74	793.35	793.93	790.34	357.0	185.7	734.7	₽
FT-SE 100	1607.1			1604.4			832.39	664.42	832.39	
					10079,1)	1601.9	1717.6	1370,1	17176	944

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ac ur iJ. ha the de fac ecc Go the fai an 2T2C

CURRENCIES, MONEY and CAPITAL MARKETS

FOREIGN EXCHANGES

Pressure grows on Bundesbank

THE BALL was rather uncercomminusly dropped into the court of the West German Bundesbank last week as the US Federal authorities stepped up their drive to breath live into a sarking US economy.

their drive to breath live into a sarking US economy.

The first jolt came on Tuesday when it was announced that US second quarter growth was up a revised 0.6 per cent from 1.1 per cent previously. This was sufficient to upset holiday season lethargy and paved the way for further measures to stave off fall in the dollar's value and a decline in oil prices and interest rates has so far falled to help redress the US trade deficit. It is however beginning to have an unpleasant effect on the trade surpluses in other countries like west Germany. The Bundesbank may not be overkeen to act on pressure from the US to hoost its domestic consumption for purely external reasons but the squeeze on profits margins which will tighten fir the dollar falls further brings the whole business a lot nearer home.

The Bundesbank has other responsibilities which to fulfil may also require a cut in the West German discount rate.

The Bundesbank has other responsibilities which to fulfil may also require a cut in the West German discount rate.

The Bundesbank has other responsibilities which to fulfil may also require a cut in the west German discount rate.

The Bundesbank has other responsibilities which to fulfil may also require a cut in the west German discount rate.

The Bundesbank has other responsibilities which to fulfil may also require a cut in the diving force within the Europe

CURRENCYMOVEMENTS OTHER CURRENCIES

POUND SPOT-FORWARD AGAINST POUND

Beigian rate is for convertible france. Financial franc 63.55-63.65.

Six-month forward dollar 2,75-2,70c pm, 12-month 4,93-4,83c pm.

FORWARD RATES AGAINST STERLING

EMS EUROPEAN CURRENCY UNIT RATES

Changes are for Ecu, therefore positive change denotes a weak currency. Adjustment calculated by Financial Times

71.3 110.3 77.0 131.4 96.8 88.3 140.0 169.1 129.6 69.6 47.6 218.3

198.55-200.12 2091-2113-10.842-10.944 9.95-10.03-10.24-10.21-2271-230 21.38-21.55 2.45-2,55

£ IN NEW YORK Spot \$1,4835-1,4845-\$1,4970-1,4889 1 month 0,57-0,55 pm 0,50-0,48 pm 3 months 1,48-1,47 pm 1,39-1,37 pm 18 months 4,95-4,89 pm 4,70-4,60 pm

nomy cennot sink without taking half the ship's complement with it. Over the past year a sharp fall in the doilar's value and a decline in oil prices and interest rates has so far falled to help redress the US trade deficit. It is however beginning to have an unpleasant effect on the trade surpluses in other countries like West Germany. The Bundesbank may not be overkeen to act on pressure from the US to boost its domestic consumption for purely external reasons but the squeeze on profits margins which will tighten if the dollar falls further brings the whole business a lot neaver home.

The Bundesbank has other

% Three p.a. months

4.40 1.50-1.47pm 2.12 0.87-0.71pm 5.25 42-37pm 3.15 46-36pm 1.70 31-11pm -0.54 0.05-0.25dis 5.92 41-49m -8.87 236-482dis -1.15 4-8dis -1.15 4-8dis 2.79 51-43pm 0.56 11-12pm 5.26 3-22pm 5.18 251-22-3pm 5.11 31-31-31pm 6.11 31-31-31pm 6.11 31-31-31pm 6.11 31-31-31-31-31 (rane 83.55-63.55)

±1.5368 ±1.6403 ±1.1127 ±1.3659 ±1.5069 ±1.6683 ±4.0734

• Selling rate.

an extent that it has moved from a position at the base of the system to near the top in just three months. Demand for the DMark has played its part in punishing the weaker members such as the Danish krone and current parity levels are going to become increasingly irrelavent unless the D-Mark is held in other.

in check.

The West German authorities are known to be cautious and there is no meeting of the Bundeshank's central council anticipated before Thursday's regular forinightly gathering. However there is a band of opinion claiming that a cut in the discount rate may not be all that bitter a pill to swallow. With a healthy trade surplus and zero inflation, there may be sufficient leeway for another cut in rates without contributing significantly to the dangers of over heating the economy. Friday's M3 money supply figures showed a DM 50n rise in July 1985 but at least down from June this year when it rose by DM 9.4bn.

The case for a cut in rates The case for a cut in rates certainly seems to carry a lot of weight and it may be that the Bundesbank wil be left only with the decision of not whether to cut but when. Prices in the futures tables are all for August 22.

CURRENCY RATES

12 31₂ 185.933 8 8.85789 - 161.748 8 8.34748 4 1,99785

Calls Mar 6.45 5.29 4.17 3.19 2.32 1.55 1.22 LIFFE E/\$ OPTIONS E25,000 (cents per E1) LONDON SE E/S OPTIONS £12,500 (cents per £1) Calis—Last
Sept Oct Dec Mar
8.10 — 18.10
8.10 8.10 8.10 8.20
8.30 3.80 4.40 4.90
0.60 1.45 2.60 2.60
0.15 0.55 1.05 1.40
0.60 1.5 0.50 0.60
0.60 day's open int, Calis a Calis—Last Sept Dec Mar 1.77 1.77 1.71 1.52 1.52 1.47 1.27 1.28 1.24 1.02 1.03 1.01 0.77 0.85 0.80 0.52 0.59 0.61 0.28 0.40 0.44 our day's open interface

High Low 107-15 100-14 100-27 100-02

Prev 94.40 94.41

Aug.22; £ | S | DM | YEN | F Fr. | S Fr. | H FL | Unt | C 8 | B Fr.

0.324 0.489 1 75.00 3.375 0.808 1.128 589.0 0.680 20.67 4.386 6.524 13.33 1000 43.67 10.77 15.04 9186 9.068 276.7

1.004 1.494 3.055 229.0 10. 2.465 3.445 2103 2.076 63.12 0.407 0.606 1.238 92.67 4.066 1. 1.597 853.2 0.842 25.60

0.992 0.434 0.886 66.47 8.903 0.716 1. 610.6 0.603 18.32 0.477 0.710 1.451 108.8 4.754 1.172 1.638 1000 0.987 30.01

C 5 0,484 0,719 1,470 110.5 4.816 1,187 1,659 1015 1, 30,40 BFr. 1,591 2,367 4,837 362,8 15,84 3,906 5,457 3535 3,290 100.

Yen per 1,000: Franch Fr per 10: Lira per 1,000: Belg Fr per 100.

1.488 3.040 228.0 9.952 2.455 3.430 2095 2.068 62.95 1. 2.045 153.4 6.695 1.651 2.506 1408 1.590 48.26

CERT. DEPOSIT (IMM

EXCHANGE CROSS RATES

CURRENCY FUTURES

LIFFE-STERLING £25,000 \$ per E

LONDON THREE-MONTH EURODOLLAR SIm points of 190% Sopt 121-07 121-24 121-06 122-03
Dec 121-06 121-22 121-06 122-03
Dec 121-06 121-22 121-06 122-01
March 120-31 — 121-26
Est. volume 10.825 (8.830)
Pravious day's open int. 17,160 (16.934)
Basis quote (clean cash price of 13%.
Treasury 2004-08 less equivalent price of near futures contract) —4 to 4 (32nds). Est. volume 5.294 (4,184) Previous day's open int. 20,659 (20,261) Est. valume 7,000 (5,687) Previous day's open int. 6,895 (6,988)

THREE-MONTH STERLING £500,000 points of 100% **CHICAGO** Close High Low Prev Sept 90.38 90.44 90.38 90.48 Dec 90.77 90.84 90.77 90.87 March 90.78 90.83 90.77 90.83 June 90.68 90.71 90.83 90.73 Sept 90.43 90.50 90.59 Est. volume 2,641 (2,508) Previous day's open int. 15,233 (15,271) Sept 162.90 High Low Prev Sept 162.90 163.00 161.50 162.60 Dec 165.75 165.20 162.20 166.55 March 168.25 — 168.05 Est. volume 219 (380) Previous day's open int. 2.471 (2.492)

DOLLAR SPOT-FORWARD AGAINST DOLLAR

1.4865-1.5020 1.4870-1.4880 0.56-0.53c pm 1.3440-1.3548 1.3445-1.3455 0.60-0.30c pm 1.3890-1.3915 1.3965-1.3915 0.25-0.29c dis 2.2975-2.3070 2.3055-2.3065 0.16-0.13c pm 42.2042-34 42.20-42.30 0.56-0.33c pm 42.20-42.34 2.20-42.30 0.56-0.23c pm 2.0370-2.0470 2.040-2.0450 0.25-0.25pf pm 145-146 145-146 105-165c dis 122.98-133.45 131.5-133.25 65-100c dis 1.298-133.45 131.5-133.25 65-100c dis 1.272-7.30° 7.29° 7.29° 4.90-5.30cre dis 5.674-6.70 6.89-6.89° 4.90-5.30cre dis 1.298-2.150re dis 1.4865-1.5020 1.3440-1.3548 1.3880-1.3915 2.2975-2.3070 42.20-42.34 7.69-7.72-2 2.0370-2.0470 145-146 132-95-133.45 1406-1411-2 7.274-7.30-2 5.674-6.70 6.842-6.89-1 152.80-153.70 UK† UK†
Ireland†
Canada
NathInd.
Belgium
Denmark
W. Ger.
Portugal
Spain
Italy
Norway
France
Sweden
Japan
Austria
Switz. † UK and Ireland are quoted in US currency. Forward premiums and discounts apply to the US dollar and not to the individual currency. Belgian rate is for convertible france. Financial franc 42.70-42.80.

EURO-CURRENCY INTEREST RATES

714·712 712 8 51: 519 912·10 513 615 718-748 718-748 5-5-2 10-1012 718.738 718.758 454.473 1018 1058 517.5-2 576 778 7-719 446 4-4 1 976 1038 578-5 712.73q 712.81g 513.513 9.912 B.Fr.(Fin).. B.Fr.(Con)

Long_term Eurodollars: two years 646-672 per cent three years 7-74 per cent four years 73-72 per cent; five years 73-75 per cent nominal. Short-term rate are call for US Dollars and Japanese Yen; others two days' notice.

MONEY MARKETS

43,1135

1476.95

Bank applies the brakes

UK clearing bank base lending rate 10 per cent since May 22

SOME LESS honest than others would claim that they never thought UK base rates were come to be cut soon even before the Eank of England's "not yet"

signal last week. Even if a majority of those kept a clear head, there is always a ripple of enthusiasm to greet a cut in tates elsewhere.

The half point US discount rate reduction was not a green light on its own but it may have shifted a few hearls away from red towards amber. It may be that the authorities are keen to keep a card or two up their keep a card or two up their considerations do not necesthat the authorities are keen to keep a card or two up their sleeve with Big Bang looming and privatization programmes that form an important part of Government funding.

To jest the official water is

WEEKLY CH	ANGE	IN W	ORLD INTERE	SI NA	1153
	Aug. 82	change	NEW YORK	Aug. 22	ohenge
LONDON Base rates I day interbank I mit interbank Treasury Bill Tander Bond 1 falls	10 103n 9-3 9-3 9-7 9-7	unch 'd + 0.8083 Unch 'd	Prime rates Federal funds 5 Mth. Treasury Bills 6 Mth. Treasury Bills 3 Mth. C D	8 5:9 5.61 5.66 5.70	Unch'd
Band 2 Bills Band 3 Bills Band 4 Bills 3 Min. Treasury Bills 1 Min. Treasury Bills	9% 9% 9%	Unch 'd	Lombard One mth. Interbank Three menth	5.5 4.525 4.475	Unch' d +0.025 -0,1
5 Min. Dack Bills TOKYO One month Bills Three moeth Bills	4,78125 4,71875	+0.125 'Unch'd	PARIS Intervention Rate One mth. Interbank Three month	7 718 718	Unch'd Unch'd
nkusscla Our morth Three month AMSTERDAM	716 718	-1e	One month Three month DUBLIN One month	114 114 97a	inch,q
AMSTERDAM	3 .3-	Bu	Three month	1011	+17

cand 7 bills mature in up to 14 days, band 2 bills 15 to 33 days, its 24 to 63 days and band 4 bills 54 to 31 days. Rates quoted repre-of England buying or saling rates with the money market. In other tes are penerally deposit rates in the domestic masses. In other

MANEY RATES

MICHAEL CO.						
August 33	Ov'r-nig't	One Month	Two Months	Three Months	Six Months	Lombard
Franklart Zonellar Amsturdam Toavo	4.40 4.50 5 5 10 4.3750 11% 115,	4.45 4.60 7,5.7 d 4.4.4,1 5: 51 4.78186 11m 113		41,44 5.5.4 4.71875	=	
Crusecia	91.910					

somewhat) but it seems likely that one or both of them will yield to pressure from the US. The possibility of another cut in US rates has also been discussed but unless there is a change of heart, it appears that such a move would be unlikely to create an opportunity to cut UK rates which did not already exist

(4 pm) Treasury Bills & Bonds Six month
One year
Two year
Three year
Four year
Five year
Seven year
10 year
30 year

NEW YORK RATES

BANK OF ENGLAND TREASURY BILL TENDER Aug. 22 | Aug. 15 Bills on offer........ £100m £100m Top Accepted rate of discount. 9,2654% 9,3456% Average

FT LONDON INTERBANK FIXING (11.00 a.m. August 22)

Six months US dollars Three months US dollars five reference banks at 11 am each working day. The banks are National Westmisser Bank, Bank of Tokyo, Deutsche Bank, Benque Nationale do Paris and Morgan Gueranty Trust. The fixing rates are the arithmetic means, rounded to the nearest one-sixteenth, of the bid and offered rates tor SIOm quoted by the market to

LONDON MONEY RATES

August 22	Over night	7 days notice	Month	Three Months	Six Months	Oner Yea
terbank	_	1014-1018	976 · 1076 976 · 10	850.931	9:2:9:4 B-7:9:4	9:2 9:
ocal Authority Depos ocal Authority Bonds scount Mkt. Depos	10½ 7.104	976-1016	9-1 10 8-1	959-953 104 950	912.94 10:5	10-5
mpany Depos i nonce House Depos !	_ `	10-1012	10-10 ₇₆	9-1-9-	954	825
reasury Bills (Buy) ank Bills (Buy) ne Trade Bills (Buy)	Ξ	: = :	9-1 9- 10-2	9;4 9÷	95	· =
oilar CDs	=		5,85 5.90 57g-61a	5.80-5.85	5.75.5.20 5.76.5	57; 6:8
CU Depos			71, 7.5	7-7'	6 7 ₁₀	67:-7
Troosury Bills (66)	III: ONG H	nonth 921,	per cent;	threa me	orths 91 ₃₆	per cert.

Transury Bills (soil): one month 9th per cent; three months 9th per cent. Bank Bills (soil): one month 9th per cent: three months 9th per cent. Transury Bills: Average tender rate at discount 9:2347 ret; cent. ECGD final finance Schome IV reference date July 2 to August 5 (urunive): 10:205 per cent. Local Authority and Finance Houses seven days; notice, others beven days; lacted, finance Houses Bast Rate 10 per cent from August 1 1986, Bank Derost. Rates for sums at seven days; notice 3:54-375 per cent. Confidence of Tax Deposit (Series 5): Deposit 100,000 and ovar held urbar are month 10 per cent; one-three months 9th per cent; three-six months 9th per cent; sumine months 9th per cent inner 12 months 9th per cent. Under 100,000 St. per cent. Todo 1100,000 St. per cent. Confidence of 100,000 St. per cent. Confidence 100,000 St. per cent.

Company Notices

Bank of Tokyo (Curação) Holding N.V. ed liability in the Netherlands A £30,000,000 GUARANTEED FLOATING RATE NOTES DUE 1990



The Bank of Tokyo, Ltd.

In accordance with the provisions of the Notes, notice is hereby given that the rate of interest for the three months period 21st August, 1986 to 21st November, 1986 has been fixed at 91 per cent, per annum. Coupons No. J2 will therefore be payable on 21st November, 1986 at £1,244 - 52 per coupon from Notes of £50,000 nominal and £124 - 45 per coupon from Notes of £5,000 nominal.

S.G. WARBURG & CO. LTD.

Agent Bank

GEOFUND CONVERTIBLE BONDS DIVIDEND NOTICE TICE IS HEREBY GIVEN to holders	CLASSIFIED ADV		AIEN
Bearer Shares of Geofund Convertible	RATE	Š	
ids that on or after 2 September, 1986, mont of a final dividend of US\$0.71 (ents) per share in Isue on 18 August, 16, will be made against surrender of		Per	Sing colun
pon No. 2 with one of the following		line	cm
pon Paying Apents:		(min.	_{mir
NUFACTURERS HANOVER BANK		3 tines)	3 cm
GUERNSEY) LIMITED, P.D. Bor 92. Canutacturers Hanover House, Le Tru-		£	£
hot, St. Peter Port, Guernsey, Channel	Commercial & Industri		
SIANDS: NUFACTURERS HANGVER BANK	Property	11.50	39.0
NUFACTURERS HANGVER HANK UXEMBOURG, S.A., 802 807, 39	Residential Property	9 00	30.0
louisvard Prince Henri, Lucempourg:	Appointments	12.00	41.0
NUFACTURERS HANOVER LIMITED.	Business, Investment		
Princes Street, London EC2P 2EN: EDIETBANK S.A. LUXEMBOURGEOISE.	Opportunities	11.50	39.0
3 Boulevard Royal, Luxembourg,	Business for Sale/	44.50	
istered shareholders will be sent a	Wanted Personal	11.50 9.00	39 0 30.0
que or notice of reinvestment in accor- ce with instructions already recorded.	Molor Cars	9.00	30.0
BY ORDER OF THE BOARD.	Holidays & Travel	9.00	30.0
DI OADER OF THE BOARD.	Contracts & Tanders	11.50	39.0
	Book Publishers		et 22.0
A	Premium positio		
Clubs	E8.00 per single co		
	All prices exc		
·	For lumber desail		
E has outlived the others because of a	Classified Adv		
HICY of fair play and value for money.			SMC.
ipper from 10-3,30 am. Disco and top	Manag		
usicians, glamprous hostesses, exciting orshows, 189, Regent St., W1, D1-734	Financial		
157.	' 10 Cannon Stree	t EC4P	4BY

-WestLB

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Westdautsche Landesbank, Head Office, RO. Box 1128, 4000 Düsselderf 1 International Bond Trading and Sales: Telephone 8 26 31 22/8 26 37 41 elex 8 581 881/8 581 882 ideutsche Landesbank, 41, Moorgate, London EC2R SAE/UK vons 538 6141 - Telex 887 984

Marketmakers in Deutschmark Bonds West LB Westdeutsche Landesbank

EWORLD VALUE OF THE POUND

The table below gives the latest available rate of exchange for the pound against various currencies on August 22, 1986. In some cases rate is nominal. Market rates are the average of buying and selling rates except where they are shown to be otherwise. In some cases market rates have been calculated from those of foreign currencies to which they are tied.

Abbreviations: (A) approximate rate, no direct quotation evaluble; (F) free rate; (P) based on U.S. dellar parties and going starting-dellar rates; (T) 8 (bg) buying rate; (Bk) bunkers' rates; (cm) commercial rate; (cb) convertible rate; (th) financial rate; (exC) exchange certificate rate; (nc) non commercial rate; (sg) selling rate; (c) controlled rate.

COUNTRY	CURRENCY	E STERLING	COUNTRY	CURRENCY	YALUE OF £ STERLING	COUNTRY	CURRENCY	VALUE OF £ STERLING
Afghanistan	Aigheal	99.00	 Gharia	Cedi	134.91	Pagama	Balibao	1.4875
Albania	Lek	10.08	6bretter	Gibraltar £	1.0	Papua New Guinaz	Kima.	1.4593
Algeria	Dicar	6.95	Greece	Drachena	200.625	Paraguay	Guarani	(358.08 (10)
Andorra	(French Franc Spanish Peseta	9.9575 198.7	Greenland	Danish Krone E. Carlibban S	11.4800 4.05			1966.07 (7)
Angola	Kentzz	44.963	Grecada	Local Franc	9.957 5 0	Peru	inti Philipine Peso	exe(A)20.80 30.05
Antique	E. Caribbean S	4.05	CONTROLLS	U.S. S	1.4875	Philipines	(£ Sterling	20.00
Argentina	Austral	1.4560	Guatemata	Quetzal	14875	Pitcaim Islands	LNew Zealend S	3.0748
Aruba	Florio	2.6775	Guinez	Franc	510.17(19)	Poland	Zioty	249.70
Australia	Australian \$	2.4743	Guinea-Bissau	Pesa	256.28	Portugal	وانتعع	215.68
ــــــــــــــــــــــــــــــــــــــ	Schilling	21.40	GDy202	Gityanese \$	5.9960	Puerto Rico	U.S. \$	1.4875
A xtes ,	Portuguese Escudo	215.68) Halti	Gourde	7.4375	Qatar	Qateri Ryel	5.4605
Batramas	Baluma S	1.4875	Honduras	Lempira	299	Reguion Isle de la	French Franc	9.9575
Rahvain	Djest.	0.5655	Hong Kong	H.K. \$	11.6880	Romania	Leo	∫(cm) 6.46
Batearic Islands	Scenish Peseta	198.7	Hurgary	Foriat	65.238	ł		(<i>NJC</i>) 15.92
Sangladesh	Taka	44.60	Iceland	icelandic Krona	60.766	Reanta	Rwantia Franc	126.45
Barbados	Barbados \$	2.99	استعمار المتعادات	Indian Rupee	18.75	St. Christopher	E. Caribbean \$	4.05
Belgiatt	Belgian Franc	(cm) 62.85	Indonesia	Rucish	1,695.565	St. Helena	St. Helena £	1.0
		((ta) 63.60	1726	Rind	113.60	St. Lucia	E. Caribbean \$	4.05
Belize	B \$	2975	Ireq	Iragi Diner	0.4587	St. Pierre	Local Franc	9.9575
Bernuda	C.F.A. Frenc Bermudan S	497.88 1.4875	Irish Republic	Prest	1.1070	St. Vintert Samoa American	E. Céribbean \$ U.S. 5	4.05 1.4875
Blantan	Ngultrum	18.75	19736i	Shekel	2-20 2094-50	San Marino	U.S. 3 Italian Lira	2.094.50
Bolivia	Balivian Peso	(a) 2861453.5	lvory Coast	Lira C.F.A. Franc	497.88	São Tome & Principe	Dobra	55.91
Botswana	Pula	3.0945	ŧ -			Saudi Arabia	Saudi Ryat	5.6163
Brazil	Cruzzado	20.595 (20)	Jameica	Jamaican Dollar	7.5420(sg)	Secegal	C.F.A. Franc	497.88
British Virgia Islands	U.S. Ş	1.4875	jacau	Yest	228,00	Seychelles	S. Ropes	8.72
Brynel	Brunei \$	3.2180	Jorden	Jordanian Digar	0.5128	Sterra Leone	Leane	(c) 44.08B
Bulgaria Burkino Faso	Lev C.F.A. Freec	1.3830 497.88	Kampuchea	Riel	N/A	Singapore	Singapore \$ Solocum is. \$	3.2180 2.6605
Burera	Kyat	10.8267	Kenja	Kenya Shililag	23.85	Someti Republic	Somali Shittes	20000 53.55
Burnerdi	Burned Franc	178.0	Kirturi	Australian \$	24743	South Africa	Rand	3.8868
			Korea (North)	Woo	1.3983	Scale	Peseta	198.70
Cameroon	C.F.A. Franc	997.88,	Korea (South)	Won Kuwaiti Disa-	1319.00 0.4355	Spanish ports le		_
Çarada	Canadian \$	2.0675	CHASE	White Name.	W4333	North Africa	Peseta	298.70
Canary Islands	Spanish Peseta Cape V. Escudo	198.7 132.78	L205	New Kip	52.0625	Sri Larks	S.L. Rapee	42.10
Cape Verde Islands Cayman Islands	Cayman ides. \$	1.24	Lebagod	Lebanese £	64.5215	Sudan Republic	Sudan É	3.7288
Cent. Air. Republic	C.F.A. Franc	497.88	Lesathe	Maluti Libertos S	3.8868	Surinam	S. Guilder Lilasseel	2.6552 3.6968
Check	C.F.A. Franc	497.88	Liberia	Liberas Sinar	1.4875 2.4711	Sweden	Swedish Krona	10.2450
Chile	Chilean Peso	289.09	Lechtenstein	Swiss Franc	2.4550	Switzerland	Swiss Franc	2.4550
China	Renmint Yuan	5.5443	Lexembourg	Lipsembourd Franc	62.85	Syrta	Syrian £	(W) (D) 9.0
Colombia	Coi. Peso	(F) 297.10	1	•		3774	cyrum z	l(cm) 5.8384
Comoro (slands	C.F.A. Franc C.F.A. Franc	497.88 497.88	Matera	Pataca Portuguese Escudo	12.1772 215.68	₹		
Costa Rica	Colon	(U) 84.59	Malagasy Republic	M.G. Franc	1102.50	Talwan	New Tahuan \$ Tan. Shilling	55.71 62.50
Cobs	Cuban Peso	1.3027	Malawi	Kwacha	2.9650	Theliand	Baht	52.50 38.70
Cypris	Cyprus £	0.7330	Małaysia	Ringgit.	3.8995	Tago Republic	C.E.A. Franc	497.88
		((com) 8.95	Maldive Islands	Ruffyra	30.4125	Tongs Islands	Palance	2.4743
Czechostovakia	Korusa.	ntc 25.59	Mail Republic	C.F.A. Franc	497.88	Trinidad & Tobago	Trunidad & Tob. \$	5.9550
		(m 15.23	Melta	Maitese E Local Franc	0,5598 10,0600	Tunisia	Tunislan Dinar	1.2847 (sg)
Denmark	Danish Kroner	11.4800	Martinique	Cucuina Cucuina	10.0600 112.24	Torkey	Turkish Lira U.S. S	1007.70
Djibosti Republic of	Djibouei Franc E. Caribbaan S	260,0 4.05	Maurities	Maurisian Russe	19.525	Turzby	Australian \$	1.4875 2.4743
Dominicas Republic	Dominican Peso	4.1939 (7)	Mexico	Mexican Penn	((F) 1037.69		-	(F) 7,300.0
Ocumentary reputors	political PESO			•	(E) 1007.59	} Uganda	Uganda Shililog	2.000.0 (4)
Emador	Sucre	(6) 245.B0 (18)	Miqueion	Local Franc	9.95750	United States	U.S. S	1.4875
¢2200	344 5	(F) 247.08	Afchaco	French Franc	9.9575	Uragray	Uruguay Peso	236.30
Egypt	Egypthan C	(1.0413 (T) 2.00	Mongoria	Tugrik E. Caribbean S	4.9913 4.05	United Arab Emirates .	U.A.E. Dirham	5.4985
Fi Salvador	Colon	7.46	Morocco	Cirhago	23.05 (sp)	VSSR	Rouble	1.0089
Envanorial Guinea	C.F.A. Franc	497,88	Mozambique	Metical	(A) 59.96	Vanican	Vzta	148.25
Ethipola	Ethicolan Birr	3.105	Namibia	S.A. Rand	3.8868	Yatican	italian Lira	2,094.50
Falkland Islands	Faticiand Isles E	1.0	Stauru Islands	Australian S	2.4743 ·	Venezuela	Bolivar	(4) 6.40
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Figi istands	FI# \$	1.7333	Netherlands	Guilder	3.4300	Vietman	Dong	(a) 17,607(15)
Finiand	Markka	7.311B	Netherland Astilles	Antillian Gulider	2.6775	Virgin Islands U.S.,	U.S. \$	1.4875
France	Frant	9.9575 497.88	New Zealand	N.Z. S	3.0748	Western Samoa	Teta	(A) 3.34c0
French C'ty in Africa	C.F.A. Franc Local Franc	997.88 9.9575	Niger Republic	Cordoba C.F.A. Franc	(p) N/A 497.88	Yemen (North)	Rval	
FIGURE UNIONS	C.F.P. Franc	7.75/3 175.0	Nigeria wini	Naira	1.969641	Yennen (South)	Kyas S. Yemen Dinar	(A) 10.4965 (sg) 0.5147
		497.68	Norway	Norwedian Krose	10.8500	Yugoslavia	New Y. Dinar	0.5147 597.57
French Pacific Islands .					_	,		
Gabon	C.F.A. Franc		1	Mark 6	0.00	Zaize Regoldie	7eles	00 200
Gabon	C.F.A. Franc Dalasi Ostmark	10.80 3.0400	Orress Suitemate of	Rial Omani	Q.57 67	Zaire Republic	Zeire Kwarto	89.2782 8.609
Gabon	Dadasi	30.80	1	Rial Omani Pakistan Rupee	0.57 69 25.05	Zaire Republic	Zaire Kwasta Zimbabwe \$	89.2782 8.608 2.5325

Incorporated in the Republic of Botswana

INTERIM REPORT

Results of the company and its subsidiaries for the six months ended June 30,

1996			
		ar ended 1e 30	Year ended Dec. 31
Production and Sales (Tonnes)	1986	1985	1985
Production at mine-metals contained in matte			-
—Nickel	10,173	9,905	19,565
—Copper	11,212	11.055	21,692
—Cobalt	89	127	222
Sales	8.263	A 157	17,324
—Nickel	9.008	9,157 10,308	17,324
—Copper ———————————————————————————————————	9,006 76	115	190
—coott	10	***	200
	Half-yea	r ended	Year ended
Consolidated Income Statement	Jun	e 30	Dec. 31
(Unaudited)	1986	1985	1985
	P'000's	P000's	P000's
Sales	54,106	60,141	120,134
On another	15.688	23,188	45.722
Operating profit	(3,806)	(3.943)	(9,060)
Realised currency exchange profits/(losses)	7,219	(2,380)	(10,447)
Profit before deferred interest, deferred royalty and			
unrealised exchange adjustments	19,101	16,865	26,215
Interest accrued but deferred for payment	(75,599) (3,033)	(68,260) (3,604)	(144,765) (6,540)
Royalty accrued but deferred for payment Unrealised currency exchange profits/(losses)	15,096	(115.046)	(270,866)
. , , , ,		(110,010)	(210,000)
Loss before extraordinary item	(44,425)	(170,045)	(395,956)
Extraordinary item			(63,358)
Net loss attributable to the shareholders of Botswana			
RST Limited	(44,425)	(170.045)	(459.314)
Accumulated deficit at beginning of the year	(1,181,412)	(722,098)	(722,098)
11.00mm711.07 40mm11 44 549		(,,	
Accumulated deficit	(1,225,837)	(892,143)	(1,181,412)
No. 1 (12)		-	
Net loss attributable to the shareholders of Botswana RST Limited per ordinary share:			
Pula	P2.47	P9.46	P25.55
Sterling	£0.78	£4.10	£8.40

U.S. Dollars	\$1.20	\$5.32	\$12.10
Exchange rates used above: P1=	£0.3170	£0.4335	£0.3290
P1=	\$0.4860	30.5625	\$0.4735
	, 	•	
	Half-year		Year ended
	June 1986		Dec. 31
Capital Expenditure and Commitments	1986 1986	1985 P000's	1985 P000's
Capital expenditure	2.291	2.040	4.031
Capital commitments	3,079	1,164	4,031 691
Capital expenditure approved by the directors but	2,0.0	202	
not committed	2,939	1,280	745
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Review of Operations

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Operations at the Phikwe and Selebi mines, operations at the Frikwe and Seleon mines, and at the treatment plants continue to be satisfactory. Mine costs per tonne of metal contained in matte increased by 4.0% above the level of the last six months of 1985 and production of contained metal increased by 5.3% from 20,392 tonnes to 21,474 tonnes. During the period 19,499 tonnes of metal contained in matte were shipped to the Falcoubridge refinery at Kristiansand and Falconbridge refinery at Kristiansand and delivered to refiners in Southern Africa.

delivered to refiners in Southern Africa.

LME nickel and copper prices, which started the year at U.S.\$1.85/lb and U.S.\$0.64/lb respectively, failed to improve and remained largely unchanged during the period under review. At June 30, 1986 the LME cash nickel price was U.S.\$1.83/lb and the new LME copper grade "A" price was U.S.\$0.63/lb. Free market cobalt prices, which were U.S.\$10.75/lb at the start of the period, declined sharply in the second quarter and were U.S.\$4.95/lb at June 30, 1986. For much of the period sales revenue, in Pula terms, was adversely affected by the strengthening of the Pula against the U.S. Dollar. However, in late May and June, the Dollar. However, in late May and June, the Pula, which started the year equal to U.S.\$0.47 and rose to a value of U.S.\$0.61 in April, delined sharply to a value of U.S.\$0.61 in April, deline 30 1000 U.S.\$0.49 at June 30, 1986.

These factors combined to reduce the operating profit to P15.7 million compared with a profit of P23.2 million for the correswith a profit of P23.2 million for the corresponding period of 1985 and a profit of P22.5 million for the half-year to December 31, 1985. After interest paid of P3.8 million (1985: P3.9 million) and realised exchange profits of P7.2 million (1985: P2.4 million loss) the profit before deferred interest, deferred royalties and unrealised exchange adjustments was P19.1 million (1985: P16.9 million) for the period. The loss for the period after deferred interest of P75.6 million (1985: P88.3 million), deferred royalty P3.0 million (1985: P3.6 million) and unrealised exchange profits of and unrealised exchange profits of P15.1 million (1985: P115.0 million loss) was P44.4 million (1985: P170.0 million).

The capital expenditure of BCL Limited (BCL) during the six months under review was financed from operations. In accordance with the terms of the restructuring agreement dated July 31, 1985 emergency funding was increased during the period by U.S.\$8.9

million, U.S.\$11.1 million was paid to AMAX Inc in respect of the Amax Nickel, Inc (ANI) indemnity amount and P0.4 million (ANI) indemnity amount and P0.4 million was paid to Government in respect of the minimum royalty for the six months to December 31, 1985, Available cash was insufficient to pay the full amount of the ANI indemnity amount falling due, emergency funding of U.S.\$14.1 million remained outstanding at June 30, 1986 and no senior debt obligations were discharged or 1986 royalty payments made. The principal shareholders increased their loans to the group by P1.5 million to finance loan repayment obligamillion to finance loan repayment obliga-tions, interest and expenses of the company during the period.

For accounting years commencing after June sor accounting years commencing after June 30, 1985 Botswana has adopted the standards laid down by the International Accounting Standards Committee and the accounting policy of the group for exchange losses/profits on loans raised to finance mining assets and other capitalised expenditure has been changed in accordance with standard LAS21 Programs of the profit o IAS21. Previously such exchange losses/ profits were capitalised but in the period under review are included in income and the comparative figures restated. The effect has been to increase the unrealised exchange profit during the period under review by P2.7 million, increase the unrealised exchange losses for the half-year ended June 30, 1985 and for the year to December 31, 1985 by P26.3 million and P72.9 million respectively and increase the accumulated deficit at January 1, 1986 from P992.6 million to P1,181.4 million.

The fallure of metal prices to improve has led to a further deterioration in the company's financial position and unless there company's mancial position and unless there is a substantial rise in such prices a further restructuring of BCL is indicated at the end of the present deferral period for senior debt and royalty obligations on December 31, 1987. In view of the substantial accumulated losses of BCL it is not envisaged that dividends will ever be paid.

M. B. Bayliss Directors A. B. McKerron

Registered Office: Administration Block **BCL Mine Site** Selebi-Phikwa Botswana

August 26 1986

CONSTRUCTION CONTRACTS

£200m Eastbourne development plan

BY JOAN GRAY, CONSTRUCTION CORRESPONDENT

Tarmac is negotiating for a 200m project to develop a new harbour, village, marina, shopping centre and business park in the south coast resort

of Eastbourne.

The planned development—known as the Crumbles Harbour Village—will be on 400 acres of beach, gravel and sand dunes at the eastern end of the promenade towards Pevensey Bay.

The site is owned by the Duke of Devonshire; the Buthess of Devonshire—one of the Mitford sisters—is a non-executive director of Tarmac.

The partners in the development, the Chatsworth Trustees and Enterprise Zone Developments, are now trying to raise finance for the project. They are hoping to appeal to an international market. describing the village as blending the charm of a

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traditional northern European town such as Honfieur with Grimand and the commercial viability of harbourside Baitimore USA."

It will, they hope, transform Eastbourne into the Riviera of Britain, and offer its discriminating residents the chance to walk home from work for an evening sailing, "followed by a meal in a fine restaurant and a moonlit stroll along the quay."

The scheme will have an outer tidal harbour with capacity for 400 vessels—yachts and the local fishing according to the developers prospectus—leading to an inner marina with moorings for a further 500 vessels. There will also be a cobbled quayside and 2,000 homes designed to echo the character of a fishing village.

FINANCIAL DIARY

The following is a record of the principal business and financial engagements during the week. The board meetings are mainly for the purpose of considering dividends and official indications are not always available whether dividends concerned are interims or finals. The sub-divisions shown below are based mainly an area to the context when the context were the context were the context were the context when the context were context when the context were context were context.

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Cons Fringstoways 20.5cts
Exton Corp 40cts
Exton Standard Bank Imp and Export Fin 1992 6128.39
Eelevision South 39
Throgmortup Tot 2.75p
COMPANY MEETINGS—
AIM, Great Essent Hotel, Liverpool Street, EC, 12.00
Avana, imp-on-the-Abenne, Circle Way 2.88t. Cardin, 10.30
Cowan de Groot, Great Eastern Hotel, Liverpool Street, EC, 12.00
Davenport Knithvear, Alles House, Newsrick Street, Leccuter, 1.30
Lech Interests, Highbury, 4. Year Toe Head, Mossiley, Birmingham, 12.00
Stormgard, Goring Hotel, Bweston Place, 50, 11.00
SOARD MEETINGS—
Finals: COMPANY MEETINGS— Howard Hotel, Temple Place. IC. 12.00 low 7st. 65, Buckingham Gate. 41-44, Greet Queen Street, WC.

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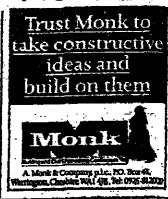
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EUROPEAN OPTIONS EXCHANGE



John Laing to build **Swindon headquarters**

The construction of a multimillion pound headquarters for PHH International is the largest design and construct contract ever to be awarded to JOHN LAING CONSTRUCTION in the south west region. The ffm contract will cover the building of a three-storey steel frame office development situated at the Windmill Hill site in Swindon. The headquarters will consolidate the existing six business locations of PHH and is part of a continuing expansion of services for the company, both in the UK and Europe. Occupying 129,000 sq ft the building will initially house 650 people with contract work nearly film. The largest, valued at over £2.3m is a concrete frame package for the Free Trade Wharf first currently under construction in Docklands for Regalian Homes.



Shepherd wins orders worth £13m

SHEPHERD CONSTRUCTION has secured contracts worth over film. The contracts tactude major projects for Lewis's; British Home Stores; ICI; and St John's College, Cambridge, in Stoke-on-Trent, Lincoln, Harcies-field and Cambridge respectively. The largest, worth £3.9m, is for the second phase of the extension and refurbishment of the Lewis's department store in Hanley, Stock-on-Trent, Shepherd's York office has begin site work on refurbishment and extending the Lincoln EHS store under a £2.8m, 32 week, contract for completion in April 1987. The latest of a number of contracts undertaken at ICI pharmaceuticals divison's Alderley Park site is worth over £2.5m. It involves construction of the superstructure of a two-storey laboratory, for completion in April 1987. A further research orientated project, this time for St John's College, Cambridge, also has a contract while over £2m. Called the St John's Innovation Centre, it will be a two-storey research and development building in Cowley Road, SHEPHERD CONSTRUCTION two-storey research and develop-ment building in Cowley Road, Cambridge

While the Old Balley is closed for its six-week summer recess, TROLLOPE & COLLS will be busy re-roofing two courts and refurbishing Court No. 1, and making major alterations to the basement. The Court is to be given a complete facelift, including the restoration and polishing of the oak papelling and beackes, the re-upholistering of the furniture, and re-carpeting throughout. The roof is to be stripped of its existing slate tiles and timber battoning, and rectad in slate. The £500,000 contract is being carried out for the City of London Corporation. While the Old Bailey is closed

II (Ross

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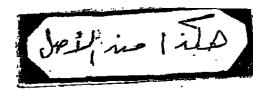
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Gérard Justafré, Managing Director 19, rue du Rhône, 1211 Geneva 3/Switzerland Telephone 022/284133, Telefax 022/214010 Telex 423 403 bilg ch



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Financial Times Tuesday August 26 1986 21 LONDON RECENT ISSUES **AUTHORISED** FT UNIT TRUST INFORMATION SERVICE EQUITIES **UNIT TRUSTS** 0345 737373 Brown Shiple 0345 737373 B.S. Portlone Fed 8.S. Saccom. Albery Unit TEL Integral Of Holderbury Rin, Boarnestial Rings income Clark & Fred Int. 18.1 Mag Inc. Evants 1957 -| bd 5.25 2.9 | 43 | 11.5 |
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1 You French kissers show up
well in a bed (6)
4 Put lid of fashion back with bloomer (8)
9 Direction to a little turnip — Do Semante Pera a Charty Pera UK Provident Unit Trust Managers Ltd
UF Hoose, Caste St Salmany SP1 38H 0722 736242
UF Envir - 1119 1199 - 031 Worth Forence - 1119 120 (1 - 03) Pacific Base - 2736 1845 - 277 rise! (6)
10 Face split by left to chin with 10 Face split by left to cain with practice in the garden (8)
12 Has crop of restless footballers included (8)
13 Alyssum cultivation pointless in hospital (6)
15 Oriental hide-away or garden (4) 15 Oriental hide-away or garden (4)

16 A revolutionary zeal as often seen in the border (7)

20 Ran into clipped bush (7)

21 Food in the King's head followed by a drink (4)

25 Make trips around hospital and look for insects (6)

26 Plant right in peal to chain each and look for insects (6)

27 Up rising over politicians holding relations fare (8)

(8)

18 Goat ran right round a herb (8)

4 number for example point to a gallery (8)

28 Sprout chops up like a dream (6)

29 Gardener ran down prune for a short trip (6)

20 See our under clothing stuck

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(8)
29 Cut branch meeting with American before a passage is covered (6)
30 Garden produce is shared around (8)
31 The colour of a Negro? (6)

The solution is the up in the trees (6)
27 Rush from you the French (4)
38 Garden produce is shared around (8)
39 The colour of a Negro? (6)

DOWN I Fluster French cook with The solution to last Saturday's prize puzzle will be published with names of winners next Saturday.

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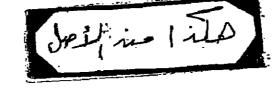
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Financial Times Tuesday August 26 1986 **INSURANCE, OVERSEAS & MONEY FUNDS** Pacini Genth Aug 20 15-44

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NZI OVERSEAS FINANCE N.V.

Notice to the holders of the outstanding US\$50,000,000 10½ per cent. Guaranteed Convertible Bonds Due 1994 denominated in US Dollars ("the Bonds")

convertible into ordinary shares of NZI Corporation Limited ("Ordinary Shares")

Conversion Right Expiry Date: 20th October, 1986 Redemption Date: 27th October, 1986

NOTICE OF REDEMPTION

NOTICE IS HEREBY GIVEN to the holders of the outstanding Bonds that, in accordance with the Conditions endorsed on the Bonds ("the Conditions") and pursuant to the provisions of the Trust Deed dated 1st November, 1984 ("the Trust Deed") between the Company of the one part NZI Corporation Limited of the second part and The Law Debenture Trust Corporation p.l.c. ("the Trustee") of the third part constituting the Bonds, the Company will on 27th October, 1986 redeem all of the Bonds then outstanding at 103 per cent. of the principal amount, together with the interest from and including 1st August, 1986 down to and including 27th October, 1986 amounting to US\$25-37 per Bond (that is to say an aggregate of US\$1,055-37 for each US\$1,000 principal amount of Bonds). This Notice is given in accordance with Conditions 7 and 14.

RIGHTS OF CONVERSION

Holders of Bonds are reminded that they may exercise the right to convert the principal amount of his Bond(s) into Ordinary Shares not later than 20th October, 1986.

Bonds may be converted into Ordinary Shares at the Conversion Price of NZ\$1.32 per Ordinary Share which using the fixed exchange rate specified in the Conditions of NZ\$1=US\$0.4871 results in a conversion rate of 1555.2776 Ordinary Shares for each US\$1,000 principal amount of Bonds.

As provided in the Conditions, any holder of Bonds who wishes to exercise his right to convert must As provided in the Conditions, any holder of Bonds who wishes to exercise his right to convert must obtain a Conversion Notice from the specified office of any Conversion Agent (set out on the reverse of the Bonds and at the foot of this Notice), complete and sign the same in accordance with the instructions thereon and deliver it with his Bond(s), together with all unmatured Coupons, at the specified office of any Conversion Agent at any time up to the close of business on 20th October, 1986. The Conversion Agent will require payment of an amount equal to the face value of any such Coupon not so delivered. A Bondholder delivering a Bond for conversion must pay all stamp, issue, registration or other similar taxes and duties (if any) arising on conversion in the country in which the Bond is deposited for conversion or payable in any jurisdiction consequent upon the issue or delivery of Shares to the order of a person other than the converting Bondholder. to or to the order of a person other than the converting Bondholder.

On 11th August, 1986 the Current Market Price (as defined in the Trust Deed) of the Ordinary Shares on the New Zealand Stock Exchange was NZ\$ 1896 per Ordinary Share (which converted into US Dollars at the rate of exchange on 8th August, 1986 is equivalent to US\$0.966). At such price, the holder of a Bond of US\$1,000 principal amount would receive upon conversion Ordinary Shares having a value of US\$1,503.096. Such value is, however, subject to variation with both the market value of the Ordinary Shares, and any fluctuation in the rate of exchange between US Dollars and NZ Dollars.

SO LONG AS THE MARKET VALUE OF ORDINARY SHARES IS NZ\$134 OR MORE (AND ASSUMING NO ADVERSE MOVEMENTS IN THE AFORESAID RATE OF EXCHANGE), HOLDERS OF BONDS WILL UPON CONVERSION RECEIVE ORDINARY SHARES HAVING IN AGGREGATE A GREATER MARKET VALUE THAN THE CASH WHICH THEY WOULD RECEIVE ON REDEMPTION OF THEIR BONDS. FAILURE TO DELIVER BONDS FOR CONVERSION ON OR BEFORE 20TH OCTOBER 1986 WILL AUTOMATICALLY RESULT IN REDEMPTION AT A PRICE (INCLUDING ACCRUED INTEREST) OF US\$1,055:37 FOR EACH US\$1,000 PRINCIPAL AMOUNT OF BONDS.

Value of the Ordinary Shares into which each US\$1,000 principal amount of Bonds is convertible based on the Current Market Price of the Ordinary Shares on the New Zealand Stock Exchange on 11th August, 1986 (converted into US Dollars on the basis referred to above) of US\$0-966 per Ordinary Share.. ..US\$1.503-096

Redemption price (including accrued interest) for each US\$1,000 principal amount of Bonds. If any holder of Bonds wishes to accept redemption at the redemption price (including accrued interest)

he should surrender his Bond(s) together with all unmatured Coupons at the specified office of any Paying Agent (set out on the reverse of the Bonds and at the foot of this Notice) on or after 27th October,

The attention of holders of the Bonds is drawn to the Conditions and in particular to Conditions 5 and 7 which contain further details regarding redemption and conversion. Copies of the Trust Deed are avail-able for inspection at the registered office of the Trustee at Estates House, 86 Gresham Street, London EC2V 7HX and at the offices of the Paying Agents and Conversion Agents specified below. PRINCIPAL PAYING AGENT

> Citibank, N.A., Citibank House, 336 Strand, London WC2R 1HB PAYING AGENTS

Citicoro investment Bank (Linembourg) S.A. 16 Avenue Marie Therese, Luxembourg. Citibank, N.A.

Citibank, N.A. 92073 Paris la Defense, Cedex 36. Citibank, N.A. Herengracht 545/549, Amsterdam.

Citibank, N.A. CH 8022 Zurich Citibank, N.A. Neue Mainzer Strasse 40/42, D-6000 Frankfurt/Main 1.

26th August, 1986, London By: Citibank, N.A. (CSSI Dept.), Agent Bank

CITIBANC

Diamond Shamrock ends its search

By William Hall

DIAMOND SHAMROCK, the Dallas-based energy group which recently slashed its dividend following the collapse in oil prices, has ended its six-month search for a new chief for its exploration operations. It has appointed Mr Charles L. Blackburn, 58, to be president of Diamond Shamrock Exploration Company.

Meanwhile, Mr Jack E. Little, senior vice president of Shell has been promoted to executive vice-president. He succeeds Mr Blackburn, one of three executive directors of Shell Oil and head of its worldwide explora-tion and production operations.

He will fill a vacuum at the op of Diamond Shamrock, top of Diamond Shamrock, which has been searching for an exploration chief since March when it announced it was consolidating its international and domestic exploration companies and dismissed Mr C. Barton Groves and Mr C. Dale McDoulett, the two executives running operations. the exploration

They have left Diamond Shamrock, with several other executives including Mr J. L. Jackson, the group's president, who resigned last month. Diamond Shamrock is in the

process of selling its coal and chemical businesses and concentrating on its oil and gas

New head for Gotabanken

MR SVEN ERIK RAGNAR, one of five managing directors at Skandinaviska Enskilda Banken, the leading Swedish bank, has been appointed president and executive of Götabanken.

Götabanken is the fourth largest commercial bank in Sweden. The top post has been vacant since June following the resignation of Mr Hans Mikaelsson for personal reasons. Mr Ragnar will take up office on October 1.

Mr Ragnar has spent the past 23 years working for Skandina-23 years working for Skandinaviska Enskilda Banken but says
"with tougher competition on the banking scene and in the credit and capital markets, it will be a challenge to go to something new. A smaller bank has to be more aggressive and innovative."

to that of deputy multiples to that of deputy multiples.

Mr Howe, born in Dryden, Ontario, and a chemical engineer by training, joined British Columbia Resources In vestment Corporation (BCRIC) in 1980 as president and chief executive from the presidency of Macmillan

Former office junior in line Emmerson to take top job at K Mart RCA Red

BY WILLIAM HALL IN NEW YORK

MR JOSEPH E. ANTONINI, who joined K Mart, the second-biggest US retailer, as a stock boy 22 years ago, has been appointed president and chief operating officer, putting him in line to succeed Mr Bernard M. Fauber as chief executive, when Mr Fanber retires at the end of

Mr Antomini has worked his way through the ranks of the company. Last Jamesy

tive vice-president and chief executive of K Mart's apparel division. He joined the company at the age of 22 and moved up to assistant manager of S. S. Kreage stores in New York, Pennsylvania and Connecticut.

As president and chief operating officer he will be responsible for all operating divisions of K Mart. Report-ing to him will be Mr Larry

Edmund de Rothschild in tar sands project

BY ROBERT GIBBENS IN MONTREAL

M. EDMUND de Rothschild, a former chairman of investment bankers N. M. Rothschild of the UK is becoming involved in a major tar sands mining and extraction project in Alberta.

Mr Rothschild has helped to promote and finance a number large energy projects in Canada, most conspicuously the C\$1bn (US\$780m) Churchill Falls hydro project in Labrador,

completed in the early 1970s and now regarded as one of the greatest energy bargains Churchill River at Churchill Falls, about 1,000 miles northeast of Montreal, was diverted to drive turbines with a capa-city of 5,000 Mw. The project was completed on time, on budget, just before the 1973 energy crisis, and the power is

now sold to Quebec. Mr de Rothschild has been appointed a director of Solv-Ex ments,

Canada plans a C\$260m experimental tar sands project with 7,500 barrels of bitumen daily capacity near Fort McMurray,

Phase one requires transport of 1,500 tonnes of sands from Alberta to Albuquerque for testing. If final results justify it, Shell is to go ahead on plant construction in 1988 for production in 1988 for production in 1988. duction in 1990.

The project will test a new solvent extraction technology developed by Solv-Ex Corporation, and demonstrate how production could be increased by similarly-sized modules. The Alberta Covernment is support. Alberta Government is supporting the test phase and is pre-pared to provide up to C\$86m for project construction.

A collapse in energy prices, if more than temporary, could delay most tar sands develop-ments, but Mr Rothschild Corporation, of Albuquerque, worked many years to get work New Mexico, which with Shell started on the Churchill.

Canada's science minister to have Howe as aide

BY ROBERT GIBBENS

western Canada's best-known businessmen, moves to Ottawa at the end of November to become secretary to the Minister of Science and Technology, a job that is equivalent to that of deputy minister. Mr Howe, born in Dryden,

MR BRUCE HOWE, one of Bloedel, the forest products concern. Later he became chairman and chief executive and Mr L. Jack Smith president Mr Smith moved to BCRIC from Westcoast Transmission five years ago.

> Mr Howe remains as chairman of BCRIC until November, while Mr Smith also assume the title of chief executive. BCRIC is a leading holding company started a decade ago by the British Columbia Govern-ment.

M. Parkin, executive vicepresident for K Mart stores, Mr Frederick Stevens, executive vice-president speciality retailing, and Mr Joseph Thomas, executive vice-president and chief administrative officer.

K Mart, which posted sales of \$22.4bn last year, employs on \$22.40m isse year, employs more than 300,000 staff world-wide. In the first half of its current financial year its not income jumped from \$57.6m to \$133.3m.

Ludwig to manage Dutch dredger

By Our Financial Staff

MR J. W. LUDWIG is to be appointed general manager of Amsterdam Ballast Dredging as from September 15. He will report to Mr R. B. Schemer, member of the board of management of the Ballast Nedam

Mr Ludwig will be in charge of reorganisation plans for the dredging division. These con-tain as first phase a major re-duction in staffing and elimina-tion from the fleet of older vessels for which no profitable employment can be found. Work on existing orders is,

the group says, to continue as normal. There is to be, it adds, an active acquisition effort for orders also for the trailingsuction hopper dredger "Lely-stad," which vessel is to be sioned soon.

Mr Ludwig's commission includes investigating the possi-bilitity of setting up the dredging division as an dredging division independent unit.

Seal

By Paul Taylor in New York

MR MICHAEL EMMERSON. the president of London Artists, an international artist managean international artist management concern based in London; clients of which include the fautists James Galway and Elena Duran, has been appointed president of RCA Red Seal, which carries the RCA group's classical music label. group's classical music label.

Mr Emmerson, who will be based at RCA/Ariola's New York headquarters, will redort to Mr Elliot Goldman, president and chief executive of RCA/Ariola. Before running London Artists, Mr Emmerson worked in concert promotion presenting such artists in Britain as Andrés Segovia, Artur Rubenstein, Sarah Vaughan and Pete Seeger.

Artur Rubinstein, Sa Vaughan and Pete Seeger. He also has extensive experience of the professional theatre. This includes stage direction and management of the Royal Shakespeare touring company. He founded and directed the Newcastle upon Tyne festival and for eight

years ran the Belfast Fastival in Northern Ireland. Mr Goldman, announcing the appointment, said: "Michael's extensive experience with and knowledge of classical music and its very special worldwide market made him a natural candidate for the important esition of president of Red

California bound THE ROYAL BANK of Scotland has appointed Mr James M Stott, deputy manager of its San Francisco agency and rep-

resentative office.
He is succeeded as vice-president of the bank's New York branch and representative office by Mr Alexander D. Wilson.

COMMERZBANK OVERSEAS FINANCE N.V.

U.S.\$ 100,000,000 Floating Rate Notes Due 1989

in accordance with the provisions of the Notes notice is hereby given that for the three months period from August 21, 1986 to November 21, 1986 the Notes will carry an interest rate of 61/4% per annum with a coupon amount of U.S.\$ 158.13.

Frankfurt/Main, August 1986 COMMERZBANK

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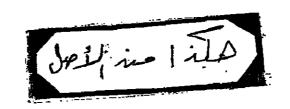
NORSK HYDRO A/S 12% EURO-NOK LOAN OF 1983/1991

The following Bonds have been drawn by lot for redemption on 15th October 1986 ~ 1st instalment:

3300 Bonds each of NOK 10000,- mos.:

Places of payment cutside Morway: Den norske Creditbonk (Luxembourg) S.A., Luxembourg Dautsche Bank Aktiengesellschaft, Frankfurt Hambros Bank Limited, London

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WORLD STOCK MARKETS

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Cle Banceire Coffmeg Damert Darty Darty Durner S.A. Enux (Cle Gen) Elf Aquitane Essilor Gen Occidentals Imetal Lefarge Coppes	- 685	Ahold Ahold Ahold Akzo Akzo Aksh. Akzo Aksh. Aksh. Broderb Cert Bos Keiks Westrn-Stehtmann Ter. Calland Higs. Dordischie Per m. Eisevier-NDS. Polities Folkter Gist Broogles Reinteken. Hugsvens Ni Int. Meseller	156.7 -4,1 567.5 -7.5 78.8 -2.3 107 -1.8 246 -4 14.7 +0.2 225 +3 19.6 18.8 70.1 -24 51.5 +0.5 186.4 -1.1 70.3 -6.2 62.1	Survetilance A 7,950 Swissel's 1,380, Swisse Bank 567- Swiss Reinace 17,500 Swiss Volksbk 2,640 Union Bank 5,880, Winterthur inh 6,825 Zurich ins 7,475. AUSTRALIA AUSTRALIA Price ** Aug. 25 Aust \$,	+5 +4 +150 +40 +40 +25 +75	Dai Nippon Infk. 528 Dai Nippon Ptg . 1,890 Daiwa House . 1,580 Daiwa Sec 8,120 Eisal 1,790 Fauto 6,400 Fuji Bank 1,720 Fuji Film . 2,810 Fujisawa . 1,390 Fujirsu . 1,000 Fijirikawa Eiset. 565 Green Cross . 2,350 Helwa Real Est . 1,250 Hitachi Credit. 2,340 Hitachi Credit. 2,340	+50 +70 -20 +100 +20 +90 -55 +23 +50 +100 -10	Multi Purpose. 0.42 OGBC. 7.90 OUB. 7.90 OUB. 7.90 Public Bank 1.05 Sime Darby. 1.42 Singapore Air. 7.65 Singapore Press. 8.35 Straits Trdg. 3.38 Tat Lee Bk. 2.66 UOB. 4.50 SOUTH AFRICA Aug. 25 Rand	-0.16 -0.01 -0.02 -0.03 -0.05 -0.05 +0.04 +0.16	Trasi
Cle Banceire Coffmeg Darmert Darty Darty Darty Darty Darty Darty Gen	- 685 - 11 - 685 - 42 - 411 - 2,650 - 20 - 3,850 + 15 - 1,495 + 1 - 1,540 - 10 - 3,33 + 16 - 3,200 + 85 - 1,050 + 50 - 61,2 + 0,7 - 1,449 + 19 - 3,644 + 5 - 2,700 - 20 - 3,460 - 10	Ahold Ahold Ahold Ahold AKZO AKSM. AKZO AKSM. AKEY Brodero Cert. Bos Kealis Westrn. Suehrmann Tet. Calland Higs. Dordische Pet'nn. Elsevier-NDS. Folkter Gist Brocades. Reinteiten. Huntr Ooug RN Int. &	136.7 -4.1 567.5 -7.5 78.8 -2.3 107 -1.8 246 -4 14.7 +0.2 225 +3 18.6 -0.9 259.5 -4 70.1 -2.4 51.5 -0.5 188.4 -1.1 70.3 -6.2 62.1 -0.2 44.4 -1.3 169 -2.5	Survetilance A 7,950 Swisselin	+5 +4 +150 +40 +25 +75 + or _	Dai Nippon Infs. 528 Dai Nippon Ptg . 1,990 Daiwa House . 1,580 Daiwa Sec 9,120 Estal	+50 +70 -70 +100 +20 +90 -55 +23 +50 +100 -100 +190	Multi Purpose 0,42 OGBC 7,90 OUB 5,08 Public Bank 1.05 Sime Darby 1,42 Singapore Press 8,35 Straits Trdg 3,38 Tat Lee Bk 2,86 UOB 4,24 SOUTH AFRICA Aug. 25 Abercom 2,6 Abercom 2,6 AE&C 13,7	-0.16 -0.01 -0.92 -0.05 -0.05 -0.06 +0.04 +0.16	Trisk Unit Triskli
Cle Banceire Coffmeg Darriy Darry Da	- 685 - 11 - 685 - 442 - 411 - 411 - 2,950 - 20 - 3,850 + 15 - 1,495 + 1 - 1,495 + 1 - 3,200 + 85 - 61,2 + 6,7 - 4,570 - 10 - 1,644 + 5 - 4,570 - 10 - 1,745 - 45 - 1,740 - 10 - 1,740	Ahold Ahold Ahold Ahold AKZO AKEN AKZO AKEN AKEV AMEN AMEN Bos Keiks Westrn Stehmann Tet. Caland Higs Dordische Pat'n Elsevier HOd Ficker Geit Brooades Aeinsten Houseven Kuntr Coug NN Int. Seuseler KLM RWP Aksarden Nat Ned Cert. Med Mid Bank Aken Aken Aken Aken Aken Aken Aken Ak	136.7 -4.1 567.5 -7.5 78.8 -2.3 107 -1.8 246 -4 14.7 +0.2 225 +3 19.6 198.8 -0.9 239.5 -4 70.1 -7.4 51.5 -0.5 188.4 -1.1 70.3 -6.2 62.1 81 -0.2 44.4 -1.3 169 -2.5 95 +2.5 95. +0.1 237.5 -2	Survetilance A 7,950 Swisselin	+5 +4 +150 +40 +40 +25 +75 + or - - -0.02 -0.05	Dai Nippon Infk. 528 Dai Nippon Ptg. 1,890 Daiwa House 1,580 Daiwa Sec. 2,120 Engl. 1,790 Fanto. 6,400 Fuji Bank. 1,720 Fuji Bank. 1,390 Fujissu. 1,000 Fijulissu. 1,000 Fijulissu. 1,000 Fijulissu. 1,000 Fijulissu. 1,000 Hitachi Credit. 2,340 Hitachi Credit. 2,340 Hitachi Credit. 2,340 Hitachi Credit. 2,340 Hitachi Sk. Japan. 2,440 ShirkawajimaHr. 450 Honda. 1,170 Indl. Bk. Japan. 2,440 ShirkawajimaHr. 450 Honda. 3,53 Hoh ICh. 899 Ho Yokado. 4,200	+50 +70 -20 +100 +20 +90 +55 +55 +50 -100 -100 +100 +100 +100 +100 +100 +100 +100 +100 +100 +100 +100 +1	Multi Purpose. 0.42 OGBC. 7.90 OUB. 5.90 OUB. 5.90 Public Bank. 1.05 Sime Darby. 1.42 Singapore Air. 7.66 Singapore Press. 8.38 Straits Trig. 2.86 Straits Trig. 4.24 SOUTH AFRICA Aug. 25 Abercom 2.6 Abercom 2.6 Abercom 2.6 Aleico Tech. 90 Aleico Tech. 91	-0.16 -0.01 -0.02 -0.04 -0.05 -0.05 +0.04 +0.06 +0.06 +0.06	Trisk Unit Triskli
Cle Banceire Corimos Darriy Darry Da		Ahold	136.7 -4.1 567.5 -7.5 78.8 -2.3 107 -1.8 246 -4 14.7 +0.2 225 +3 19.6	Survettlance A. 7,950 Swissel's	+5 +4 +150 +40 +25 +75 + or - - - - - - - - - - - - - - - - - - -	Dai Nippon Infs. 528 Dai Nippon Ptg . 1,990 Daiwa House . 1,580 Daiwa Sec 9,120 Estal 1,790 Fanuo 6,400 Fuji Bank 1,720 Fuji Film . 2,810 Fuji Bank 1,390 Fujirsu . 1,000 Firukawa Elect. 565 Green Cross . 2,550 Helwa Real Est . 1,250 Hitachi . 1,250 Hitachi Credit 2,340 Hitachi Credit 2,340 Hitachi Credit 2,340 Hitachi Credit 3,533 Itoh (C	+50 +20 +100 +20 +20 +90 +55 +55 +55 +100 +100 +190 +111 +59 +110 +30 +30 +30 +30 +30 +30 +50	Multi Purpose 0.42 OGBC 7.90 OUB 7.90 OUB 7.90 OUB 1.92 Public Bank 1.05 Sime Darby 1.42 Singapore Air 7.50	-0.10 -0.01 -0.02 -0.05 -0.05 -0.06 +0.06 +0.06 +0.06 +0.06 +0.06 +0.06 +0.06 +0.06 +0.06 +0.06 +0.06 +0.06 +0.06 +0.06 +0.06	Tresi
Cle Banceire Coffmeg Darmert Darty D	- 685 - 11 - 685 - 42 - 411 - 2,650 - 80 - 3,850 + 15 - 1,495 + 1 - 1,495 + 1 - 1,495 + 1 - 1,495 + 19 - 3,200 + 85 - 1,050 + 50 - 1,449 + 19 - 3,644 + 5 - 4,570 - 10 - 1,215 - 20 - 2,700 - 80 - 3,200 + 85 - 1,510 - 10 - 1,215 - 2,0 - 1,215 -	Ahold Ahold Ahold Ahold AKZO AKSN AKZO AKSN AKSN AKSN AMRO. Brederb Cert Bos Kails Westrn-Stehmann Tet. Calland Higs. Dordische Fet m. Eisevier-Nöd Folker Glat Broozdes Reinteken. Hoogsvens Hunt Rougher KI.M KNIP KNIP Raarden Rat Ned Cert Nedfloyd One Gristen One Gristen One Gristen One Gristen Onemeran (Van) Pathocd	136.7 -4.1 567.5 -7.5 78.8 -2.3 107 -1.8 246 -4 14.7 +0.2 225 +3 19.6	Survetilance A. 7,950 Swissel's 1,1880, Swiss Bank 567 Swiss Roinace 17,500 Swiss Volksbk 2,640 Union Bank 5,880 Winterthur inh. 6,825 Zurich Ins. 7,475 AUSTRALIA Aug. 25 Aust 5, Aci Intl. 3,30 Adelaide Steams 11,2 Amcor 3,50 Amcar 11,2 Amcor 4,82 Ampol Pet 2,10 Ashton 1,69 Aust. Guarantee. 3,00 Aust. Surrantee. 3,00 Aust. Surrantee. 3,00 Aust. Surrantee. 3,00 Aust. Surrantee. 3,00 Bell Group. 10,5 Bell Res. 5,04	+5 +4 +150 +40 +25 +25 +75 +07 -0.02 -0.03 +0.04 +0.04 +0.04 +0.04 +0.08	Dai Nippon Infk. 528 Dai Nippon Ptg . 1,990 Daiwa House . 1,590 Daiwa Sec 9,120 Eisal 1,790 Fauto 6,400 Fuji Bank 1,720 Fuji Film . 2,810 Fujisawa . 1,390 Fujirsu . 1,000 Fujirsu . 1,000 Fujirsu . 1,000 Fujirsu . 1,000 Hutachi Crodit. 2,340 Hitachi Crodit. 2,340 Hitachi Crodit. 2,340 Hitachi ShikawaimaHr. 1,170 Indi, Bk. Japan. 2,440 Jai 10,100 Jai 10,100 Jai 10,100 Jai 10,100 Jai 1,550 Kajima . 1,600 Kawasaki Stel 264 Kawasaki Stel 264 Kawasaki Stel 264	+50 +70 +20 +100 +20 +90 -155 +23 +55 +10 +100 +190 +190 +11 +50 1 +100 +30 +50 +50 +50 +50 +50 +50 +24 +50 +50 +50 +50 +50 +50 +50 +50 +50 +60 +60 +60 +60 +60 +60 +60 +60 +60 +6	Multi Purpose 0.42 OGBC 7.90 OUB 7.90 OUB 7.90 OUB 1.90 Public Bank 1.05 Sime Darby 1.14 Singapore Air 7.50 Air 8.00	-0.10 -0.01 -0.02 -0.05 -0.05 -0.05 -0.04 +0.16 -0.76	Tresion of the state of the sta
Cle Banceire Coffmeg Darmert Darty D		Ahold	136.7 -4.1 567.5 -7.5 78.8 -2.3 107 -1.8 246 -4 14.7 +0.2 225 +3 19.6 198.8 -0.9 239.5 -4 70.1 -2.4 51.5 +0.5 188.4 -1.1 70.3 -6.2 62.1 81 -0.2 44.4 -1.3 169 -2.5 68.3 +0.1 293.5 -2 179.7 -5.8 531.5 +1.5 39.2 -0.3 64 : +0.5 39.2 -0.3	Survettlance A. 7,950 Swissel's	+5 +4 +150 +40 +40 +25 +75 +75 +07 -0.85 +0.85 +0.85 +0.85 +0.87 -0.87	Dai Nippon Infk. 528 Dai Nippon Ptg . 1,890 Daiwa House . 1,590 Daiwa Sec 8,120 Eragl 6,400 Fruir Bank 1,720 Fruir Bank 1,720 Fruir Bank 1,720 Fruir Bank 1,000 Hugher Bank 1,250 Helwa Real Est . 1,250 Hitachi Crodit 2,340 Hitachi Crodit 2,340 Hitachi Sayuma Hr. 1,170 Indi. Bk. Japan. 2,440 Hitachi Crodit 353 Hondon . 1,170 Indi. Bk. Japan. 2,440 Honda 1,170 Indi. Bk. Japan. 2,440 Jat 10,10 Jusco . 1,550 Kap Corp . 1,640 Kap Corp . 1,640 Kawasaki Steel 264 Kirin . 1,600 Kobe Steel . 209	+50 +70 +70 +100 +20 +90 -100 +55 +50 +100 +100 +110 +111 +59 +50 +50 +50 +50 +50 +50 +50 +50 +50 +50	Multi Purpose. 0.42 OGBC. 7.90 OUB. 7.90 OUB. 7.90 OUB. 7.90 OUB. 7.90 Public Bank. 1.05 Sime Darby. 1.42 Singapore Air. 7.66 Singapore Prese. 8.38 Straits Trdg 3.38 Tat Lee Bk. 2.66 UOB. 4.24 SOUTH AFRICA Aug. 25 Abercom 2.6 Abercom 2.6 Abercom 2.6 Abercom 34 Angio Am. Coal. 35 Burrierys Bank. 21.5 Barlow Rand 19.3 Buffets 101 CNA Gallo. 2.3 Currie Finance. 3 UDE Beers. 32.7	-0.10 -0.01 -0.02 -0.05 -0.05 -0.05 +0.06 +0.06 +0.06 +0.16 -0.05 -0.05 -0.05 -0.05	Trasi Unit Trasi Inst C STAI
Cle Bancaire Corimeg Darriy Darry Da		Ahold	136.7 -4.1 567.5 -7.5 78.8 -2.3 107 -1.8 246 -4 14.7 +0.2 225 +3 19.6 -0.9 239.5 -4 51.5 -0.5 188.4 -1.3 169 -2.6 95.3 +0.1 92.5 +2.5 96.3 +0.1 92.5 -2 172.7 -5.8 95.3 +0.1 92.5 -2 93.5 -4 172.7 -5.8 95.3 +0.1 93.5 -2 172.7 -5.8 95.3 +0.1 93.5 -2 172.7 -6.8 95.3 +0.1 93.5 -2 94.9 +0.5 94.9 +0.1 133.3 -0.6 85.7 -0.3 80.5 -0.5	Survetilance A. 7,950 Swissair. 1, 1,880, Swiss Bank. 567, Swiss Reinsce 1,7,500 Swiss Volksbk. 2,640 Union Bank. 5,830. Wirsterthur Inh. 6,825 Zurich Ins. 7,475 AUSTRALIA AUSTRALIA Aug. 25 Aust 5, ACI Intl. 3,30 Adelaids Steams 11,3 Amoor 4,82 Ampol Pet. 2,10 Ashton 1,69 Aust. Group 4,82 Aust. Group 1,69 Aust. Guarantee. 2,60 Bell Group. 10,5 Bell Res. 15,04 Bond Corp Hidgs 3,04 Sorai 4,05 Sorai 4,05 Sorai 4,05 Sorai 4,05 Sorai 4,05 Sorai 4,05 Sorai 6,20 Sridge Oil. 0,80 Sridge Oil. 0,80 Sridge Oil. 0,80 S. H. Prop. 7,70	+0 + 150 +40 +40 +40 +25 +75 +0r -0.03 -0.03 +0.04 +0.04 +0.04 +0.09 +0.09 -0.09	Dai Nippon Ink. 528 Dai Nippon Ptg . 1,990 Daiwa House . 1,590 Daiwa Sec 8,120 Etsal 1,790 Fanuo 6,400 Fuji Bank 1,720 Fuji Film . 2,910 Fuji Film . 1,000 Fuji Isank 1,000 Hugani . 1,000 Hugani . 1,000 Hugani . 1,000 Hugani . 1,170 Indi. Bk. Japan. 2,440 Hugani . 1,170 Indi. Bk. Japan. 2,440 Hugani . 1,170 Indi. Bk. Japan. 2,400 Hugani . 1,170 Indi. Bk. Japan. 2,400 Hugani . 1,160 Hugani . 1,160 Kao Corp . 1,640 Kawasaki Steel . 264 Kamatsu . 485 Konishiroku . 480 Konishiroku . 480	+50 +20 +20 +90 +55 +25 +50 +100 +100 +110 +110 +110 +111 +59 +50 +50 +20 +20 +20 +21 +21 +21 +20 +30 +30 +30 +30 +30 +30 +30 +30 +30 +3	Multi Purpose. 0.42 OGBC. 7.90 OUB. 5.90 OUB. 5.90 Public Bank. 1.05 Sime Darby. 1.42 Singapore Air. 7.66 Singapore Presa. 3.28 Tat Lee Bk. 2.86 UOB. 4.24 SOUTH AFRICA Aug. 25 Abercom 2.6 Abercom 2.6 Abercom 34 Anglo Am. Coap. 62 Anglo Am. Coap. 62 Anglo Am. Gold. 3.4 Anglo Am. Gold. 3.3 Buffets 101 CNA Gallo. 2.3 Burfets 101 CNA Gallo. 2.3 Currie Finance. 4 De Beers 32,7 F. S. Cons. 35,2 F. S. Cons. 35,2 F. S. Cons. 35,2 F. S. Cons. 35,2 Cold Fields S.A. 53,5	-0.10 -0.01 -0.05 -0.05 -0.05 -0.05 -0.05 -0.05 -0.05 -0.05 -0.05 -0.05 -0.05 -0.05 -0.05 -0.05 -0.05 -0.05	Trasi Unit Trasi Inst C STAI
Cle Banceire Corimeg Darrier Darry D		Ahold Ahold Ahold Ahold Ahold AKZO AKSM. AKZO ASSM. AKSM. AKSM. Brederb Cert Bos Kalis Westrn. Suehrmann Ter. Calizand Higs. Dordische Per nr. Eisevier-HDG. Fokkter Gist Brocades Petitsken. Hoogevens NN Hunter Doug NN Int. Westler KLM KNP Naarden Nat Ned Cert Hed Bid Bank Ned Bid Bid Bank Ned Bid Bid Bid Bid Bid Bid Bid Bid Bid Bi	136.74.1 567.57.5 78.82.3 1071.8 2464 14.7. +0.2 225. +3 138.80.9 239.54 70.12.4 51.50.5 138.41.1 169. +2.5 95. +2.5 95. +2.5 95. +2.5 95. +2.5 95. +2.5 95. +2.5 95. +2.5 95. +0.1 225.52 178.76.8 95. +0.1 225.50.3 2020.5 50.50.3 2020.5 51.50.3 2020.5 51.50.3 2020.5 51.50.3 2020.5 51.50.3 2020.5 51.50.3 2020.5 51.50.3 2020.5 51.50.3 2020.5 51.50.3 2020.5 51.50.3 2020.5	Survettlance A. 7,950 Swissel's	+0 + 150 +40 +40 +40 +25 +75 +0r -0.03 -0.03 +0.04 +0.04 +0.04 +0.09 +0.09 -0.09	Dai Nippon Ink. 528 Dai Nippon Ptg . 1,990 Daiwa House . 1,590 Daiwa Sec 8,120 Etsal 1,790 Fanuo 6,400 Fuji Bank 1,720 Fuji Film . 2,910 Fuji Film . 1,000 Fuji Isank 1,000 Hugani . 1,000 Hugani . 1,000 Hugani . 1,000 Hugani . 1,170 Indi. Bk. Japan. 2,440 Hugani . 1,170 Indi. Bk. Japan. 2,440 Hugani . 1,170 Indi. Bk. Japan. 2,400 Hugani . 1,170 Indi. Bk. Japan. 2,400 Hugani . 1,160 Hugani . 1,160 Kao Corp . 1,640 Kawasaki Steel . 264 Kamatsu . 485 Konishiroku . 480 Konishiroku . 480	+50 +20 +20 +90 +55 +25 +50 +100 +100 +110 +110 +110 +111 +59 +50 +50 +20 +20 +20 +21 +21 +21 +20 +30 +30 +30 +30 +30 +30 +30 +30 +30 +3	Multi Purpose. 0.42 OGBC. 7.90 OGBC. 7.90 OUB. 5.90 Public Bank. 1.05 Sime Darby. 1.42 Singapore Air. 7.66 Singapore Press. 8.55 Straits Trdg. 3.28 Tat Lee Bk. 2.86 UOB. 4.28 SOUTH AFRICA Aug. 25 Rand Abercom 2.6 Abercom 2.6 Abercom 2.6 Anglo Am. Corp. 62 Anglo Am. Corp. 62 Anglo Am. Corp. 62 Anglo Am. Gold. 320 Barclays Bank. 21.5 Barlow Rand 19.3 Buffets 101 CNA Gallo. 2.3 Currie Finance 4 De Beers 52.7 Orefontem 69 F. S. Gors 55.2 Gold Fields 8.5 Highwelp Steel 6.8 Malcor 10.6	+ or - 0.16 - 0.01 - 0.02 - 0.05 - 0.05 + 0.06 + 0.06 + 0.06 + 0.06 - 0.05 - 0.05	Track Unit Track Ind Di
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OVER-THE-COUNTER	Nasdaq national market, closing prices
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75382 97936 6000 12509	Bk NScot Bell Can Bluesky Bonanza R Bow Vely	\$151 ₄ \$387 ₆ \$51 \$40 \$115 ₈	31% 15 38% 260 132	3178 1514 3834 260 140 115g	-1g +1g +1g	57040 57040 65257 1606 1600	Doracido Dome Mune Dome Pela D Textos Dominar Du Pont A	\$235g \$91g 127 \$193g \$31 \$34	23 ¹ 4 83 ₄ 125 195 ₈ 303 ₄	233g 9 125 193 ₄ 307g	-13 +39 -5 +14	1000 7419 95991 30877 4536	Nikid LP A Roranda Norcen Norcen ord 1 NC Oils	\$183 ₄ \$183 ₅ \$131 ₂ \$121 ₈ \$93 ₄	161; 1616 1316 1234 934	183 ₄ 183 ₈ 133 ₉ 122 ₄ 93 ₄	+ 1 ₄ + 1 ₄ - 3 ₈ - 1 ₈	77 181 4000 2250 2559 10725	Trimac Trinity Res Trizec A / Trizec B Ulsier P	260 50 \$313 ₄ \$321 ₂ 136	270 60 311; 32 136	280 60 3112 32	+5
200 940 42792 200 5	Bratome Bramalea Brascan A Brkwater BC ForP	150 \$212 ₄ \$277 ₈ \$51 ₇ \$123 ₄	150 2114 2759 517 1274	150 211 ₄ 273 ₄ 51 ₅ 123 ₄	- 10 - 1 ₂ + 1 ₆ + 1 ₈	45094 64868 250 3600	Dylex A Echo Bay Enico Equity Syr FCA Inti	\$1678 \$2778 531 495 \$2114	1617 2634 31 480 2014	163 ₁ 273 ₄ 31 490 211 ₄	+114 + 12	18740 4650 77183 26000 17502	Nor Tel Northgal Nva AttA f Newsco W Nu Wost	\$4094 \$528 \$518 \$1124 34	40 51 ₄ 5 111 ₄ 31	40 53 ₈ 5 111 ₄ 34	-3 ₁ + 1 ₈ + 5 - 1 ₈ + 3	650 2511 3000 500 2800	Un Caraid U Entprise U Canso Un Corp Versil A f	5143 ₄ 5111 ₇ 65 548 160	143 ₄ 311 ₄ 65 48 155	143 ₄ 113 ₅ 65 48 155	-5
11120 30305 1000 31698 5970	BC Res BC Phone Brunswk CAE CCL B I	129 \$283 ₈ \$123 ₄ \$107 ₈ \$18	128 273 123 101 177	125 28 123, 103, 1778	+1 -3 ₈		Fichbrdg Fed Ind A FCity Fin Gandall Geac Comp	\$171 \$16 \$131 ₈ \$85 ₉ 460	1712 1578 1318 819 460	173g 157e 137g 65g 450	- 1g	4013 1808 1312 3300	Osked A I Ocelot B I Omega Hyd Oshawa A I	l \$223 ₄	87 170 285 470 221	818 170 285 480 221	- 12 - 5 - 10 - 1 ₄	500 50 4845 750 5824	Vestgron Vulcan Ind Waja A Walker R	150 50 \$55 ₈ \$15 ₁₈ \$38	180 50 51: 151: 37:8	160 50 55 ₈ 157 ₈ 377 ₈	- 15 - 1 _p - 1 _p
3100 3089 300 19006 7810	CIL Cad Frv Cambridg Camp RLk Camp Res	136 257,1 254,2 252,1 256,5	261 321 241 25 195	2815 3216 2415 2516 195	+ I ₄ - I ₈ - I ₄ + I ₈ - I ₄	1000 306 2800 5300 1120	Giant Yk Gibritar Goldcorp 1 Gralton A I GL Forest	\$215g 5814 \$715 \$177g \$2274	2138 814 739 1734 22	2158 814 734 1734 2214	+ ⁷ 8 - 1 ₈ - 1 ₄	15060 83450 4900 9909 7500	PacW Airl Paul A ! Paul Bull Paul Bull Pegasus Pembua	\$181 ₈ \$143 ₈ \$26 \$111 ₂ \$141 ₇	177g 141g 26 1117 1417	18 142 ₉ 26 111 ₂ 141 ₂	+ 1 ⁸ + 1 ⁸ + 2 ⁸	8450 3300 1113	Wsiburne Wcoast T Westmin Weston Woodwd A	\$161 ₄ \$132 ₆ \$71 ₄ \$32 \$61 ₇	15 g 132g 7 g 30 6 g	1614 1312 718 3012 539	• ¹a - ¹a - 13g - ¹a
1226 7850 4962 14640 4400	Camp Soup Campeau / CCem ex p COC / Can Mail	5333 ₈ 5281 ₄ 5141 ₄ 561 ₄ 5183 ₄	33 28 141, 61 ₈ 1815	3314 2814 1414 614 1812		1720 4050 16283 100 2900	Greyfind GuarPA / Gull Can Hawker Hayes D	\$2634 \$1276 \$1452 \$28 \$145	265 ₆ 123 ₄ 141 ₂ 28 141 ₄	26% 12% 141 ₂ 28 141 ₄	- 18 + 14 - 14	2967 28840	Pjewi A I Pare Point Placer D Poco Pet Powr Cor!	\$12 ½ \$91; \$291; \$81; \$17	121- 91 ₂ 261 ₂ 81 ₃ 165 ₈	12½ 9½ 28% 83 ₈ 16%	-14 -34 +16 -18	F - No rights	voting rights				ng T
15641 5560 690 123615 3900	C Nor West C Packrs CS Pete 1 CI Bk Com C Marcons	\$151 ₂ \$161 ₈ 455 \$171 ₂ \$261 ₈	15 165 ₈ 450 171 ₄ 255 ₈	1518 1678 450 177 ₂ 2618	- 45 + 56 + 58	17400 1020 1322 11518 22740	Hees Intl H BayMn s H Bay Co Husity Oil Imasco	\$3219 \$614 \$2694 \$814 \$3419	321- 614 2556 8 3356	32 ⁷ 8 6 ¹ 4 26 ⁵ 8 8 ¹ 4 33 ³ 4	+ lg - lg + lg - lg	100 4502 7100 22690 1900	Precamb Provigo Que Sturg Ranger Rayrock (335 \$177 ₈ \$51 ₈ \$55 ₈ \$63 ₈	335 175g 495 51g 616	335 1778 518 556 618	+5 +1, +221		MON Closing pr		ugus		
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700 321 2000 26600 8135	Canfor Carron A Cara Cara A f Carl OK	\$131, \$171, \$10 \$87, \$14	132, 171, 10 83, 133,	133 ₄ 171 ₄ 10 63 ₄ 14	- 8	6420 31810	Inter City Inti Thom Inter Pape Ipsco Ivaco A f	5155g 51112 5391g 5712 5203g	1538 1114 3878 717	1538 1138 39 712 2018	+ 1 _B - 1 _a - 1 _e	32015 54017 43645 1900 2300	Royal Brik RyTros A Royes St. CemA 1 Sceptre	\$321, \$321, 336	3214 3214 315 19 255	321 ₇ 321 ₃ 325 19 255	+1 ₂	4668 5027 3300 21999 24134	ConBath DamTirst MatBk Cda Noverco	\$247, \$20 \$112, \$265, \$13	241 1958 1158 2614 1234	247, 193, 113, 261, 123,	+ 1 ₂ + 1 ₈ + 1 ₉ - 1 ₉
28061 -400 6500 14857	Carma A Celanese CentFd A Centri Tr CHUM B f	17 \$16 \$63 \$20 \$59	15 16 63 ₉ 193 ₄	151 ₂ 16 63 ₈ 20 59	+ 1 ₈ + 1 ₄	19020 515 1400 22815 36534	Jannock Kerr Add Kiens Gld Labett L1. Lsc	\$24\ ₄ \$16 \$24 \$24\ ₈ \$24\ ₈	231 ₈ 153 ₄ 231 ₂ 24 24	241 ₈ 153 ₄ 231 ₂ 241 ₄ 243 ₈	- 1g - 1 - 1g - 1g + 5g	17800 3834 50866 8400	Scott Paper Scotts 1 Seagram Sears Can Selsirk A (\$171 ₂ \$39 \$83 \$123 ₆ \$251 ₂	1714 3834 8238 1214 2538	171 ₂ 382 ₆ 82: ₈ 123 ₈ 251 ₂	- 14 - 18 + 38 + 18	24436 28775 100 5232 9385	Power Corp Provigo RollandA Royal Bank SteinbrgA	517 517 g 514	16/a 17/a 14 32/4 41	163 ₄ 175 ₈ 14 321-	+ 1 _F - 1 _P + 1 ₃
	Commico	\$13	1204	13	+74	2500	Lacana	5914	91,	914	. 49	3258	Shell Can	\$22	213	2178	- ig		ales 2.863,73			•	•

Indices

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-	Aug Aug		Ang	Autr	Aug	Aday	1	888	Since Co	apilation		Aug. ' 25	Aug. 22	Aug.	Aug. 20	19 High	986 Low	
	25 22		21	Алар 20	Aug 19	18	High	LDW	Hángh	Low	AUSTRALIA							
ustrial	1,871	I.77 L	.A87.80	1,681 1	9 1,881.3	1,862.9	ii ∫1.889.5	2 1909.0 2/7:168		1989.03 1 (2/1/86)	41.22 (2.7/32)	All Ord. (1-1:80) Metals & Mnis. (1:1:80)	1179,2 543,4	1883,8 546,5	1179.5 546.0		1247.0 (7:5) 602.0 (24.5)	1010.8 (2.1) 481.1 (20.5)
Susperi	761	75	761.75	759.13	3 752.13	744.0	B 753.3		685.97 (9/1/88)		12.32 (8/7/32)	AUSTRIA Creditbk Aktien (50/12/84	259,35	236, 11	239.73	255,71	266,64 (23 4)	226,58 (5/5)
tolisies	214	.37	217.39	39 218.21 219.15 213.38 211.13 219.15 189.47 219.15 18.5			BELGIAN Brussel SE (1,1:84)	3866,08	8665,07	5859.59	6826,89	3866,08 ,25 %	2766,91 (15:1)					
ding va	4	1	118 13	135.18	157.60=	109.31	n 112 5 44	1	-	-	-	DENMARK Copenhagen SE (3/145)	198,90	189.90	יטי .	199,91	250.70 (18:4)	195.69 -8-1-
				\neg	Ang 15	`	leng 8	Assg 1		Year Ago (Approx)		FRANCE CAC General (51/12.82)	402.4	402.10		594.2	411.8 (15.5)	267.8 (2/1)
Div Yie	Tir Yield to											ind Tendance (\$1:12/62)	154,8	155.8	153,5	151,5 -	154,5 ;25 0;	101.6 (2 1)
ANDAR	D AND F	POORS			T			195	36	Since Co	espilation	GERMANY FAZ Aktien (\$1,12:58) Commerzbank (1:12:53)	696,65 2102,2	£91.75 2091,8	685,28 2068,7	586,64 2076,6	755,88 (17:4) 2778,8 (17:4)	585.92 (22.7) 1762.4 (22.7)
	4	leg 25	Aug 22	Aug 21	Aug 20	Apg 19	Aug 18	High	Low	High	Lnur	HONG KONG Hang Seng Bank (81/7-84)	(6)	1946 D3	1941,56	1941,28	1950,12 ,18 81	1 1559,54 (19:3
ustrials	_	~ +	275.24	274.51	+	271.74	273.63	282.24 (2/7)	224.88 (22/1)	282.24 (2/1/85)	3.62 (30/6/32)	ITALY Banca Comm Ital. (1972)	812,08	814,11	814.91	808,44		454,87 (24.1)
nosite	247	L81	250.19	245.57	269.77	255.51	247-38	252.70 (2/7)	263.49 (22/1)	252.70 (2:1/85)	4.48 (1/6/32)	JAPAN** - Nikkei (16/5-49) Tokyo SE New (4/1-68)	18565.61 1548,42	18441,31 1544,15	18675.6 1568.85	10938,2 1563,35	16936_2 (20 8: 1683,35 (20.8)	12891,5 (21.1 1025.85 (21.1
				Ί	Aeg 20		Ang 13	Ang 6		Year Ago (Approx)	NETHERLANDS ANP.CBS General (1970) ANP.CBS Indust (1970)	298 7 295.7	295.8 299.6	299.6 305,2	297.5 302.3	299.6 :27 B: 303.9 :19 8:	240_4 (5 3) 254_0 (5:5)
. P/E R	64 % httic Bood Yiel				2.95 18.34 7.13		2.99 18.11 7.34	3.10 17.48 7.53		3.72 11.98 18.39		NORWAY Oslo SE (4/1:85)	880.09	358,55	 856,48	352,99	402,91 (16, 1)	331,61 (4,8,
•	AT COM							RISE	S AND FA	ais		SINGAPORE Straits Times (30:12:66)	815.79	811,34	811,65	802,94	815,79 ,25 8:	563,54 (29-4-
log 25	Ang 22	Aug 21	eg Aug		1986 Lo	 -			Aug 22	Acq 21	Aug 20	SOUTH AFRICA JSE Gold (28/9-78) JSE Indust (28/9/78)	:	=	1624.1 1500.7	1614,0 1502,3	1624.1 -22.8- 1302.6 -14.81	1109,1 (21 4) 1019,3 (2 1)
-+	$\overline{}$	143.61	143.64	High 145.1 (2/7)	5 117.	75 R	1945 Tradi 1988 1988	# i	2.801 2.027 825 999 723 683		2,897 1,876 534 397	SPAIN Madrid SE (30/12/85)	196,47	193,92	192,50	192,89	196,47 :25 8:	
_!				ryse-	Cousoi		1500 A	ctives	453	435	SWEDEN Jacobson & P 187/12,551	2517.55	2549,76	2567.68	2558,45	2620.52 (12 B.	1729,57 :29 1:	
		Stock Trade	đ	Price		lay	_	Ŧn	ocks ided	3.88p.m. Price	an Day	SWITZERLAND SwissBankCpn (81:12/58)	861,5	558,7	554.8	545,6	625.5 (8:1)	. 467.2 .4-8
i Plans es Roa I et Bank	1 1	1,690,0 1,644,5 1,163,4 1,039,2	i09 zd 140	221/ 461/ 1391/ 55	· _1	%n Sel 1⁄2 Mac	T Merseb ent Peer melicial	58 81	6,40G 2,000 8,388 3,70G	2334 3272 393a 7274	- Va + 3/a -2V2 - Va	WORLD M.S. Capital Intl. (1:1/70).	_	\$57.4	558.5 .	869.2 °	359.2 (20 B)	249,8 (23,1)
الاغتنا	B 1	023,4	1,031 1,031	494			ald free		4,500	19%	+ %		· · · · · · · · · · · · · · · · · · ·	-a 15-	·	u.L.L.a.: 4	-1 TEE /-	
CENTO				_	Τ.	١.			19	96		Saturda	A Whân	SE 10:	appan i	AIKKOI (c). TSE (c)	,
			-	Ang 25	Aug 22	Aug 21	Aprig 20	Н	oh	L	RN .							
			- 1	 -	+	 				 		Base value of all	Indices	are 100	except	Brussel	s SE-1,000.	JSE Gold-

Beneficial acts to thwart unfriendly takeover

BY WILLIAM HALL IN NEW YORK

MONTREAL Portolio

28728 - 2.024.18 2.8228 2.442.85 (21/3) 1.917.4 (5/8) 3.817.3 3.815.7 3.820.8 3.819.2 3.129.31 (78/4) 2.754.9 (17/2) 1,585,97 1,585,19 1,587,46 1,585,93 1,623,33 (16/4) 1,385,5 (72/1)

der value, including the sale of the company.

Beneficial's decision to put itself up for sale appears designed to thwart a possible unfriendly take-over bid from Alleghany Corporation, an investment company which recently disclosed that it intends to cover may not be paid when the sale of subsidiaries.

Would enable us to maximise value may be implemented. The plan provides for payments the latest sign that the problems of the sale of of the increase in the price of the company's common stock above \$70 as which may be implemented. The plan provides for payments the latest sign that the problems of the sale of of the increase in the price of the company's common stock above \$70 as which may be implemented. The plan provides for payments the latest sign that the problems of the sale of of the increase in the price of the company's common stock above \$70 as which may be implemented. The plan provides for payments the latest sign that the problems of the sale of other business combination with another entity, the sale of certain assets, repurchase of debt and equity securities and spin-off or sale appears designed to the latest sign that the problems of the latest sign that the problems of the sale of other business combination with another entity, the sale of the increase in the price of the company's common stock above \$70 as when the sale of the increase in the price of the company's common stock above \$70 as when the sale of subsidiaries.

The company disclosed that it intends to other business combination with another entity, the sale of the increase in the price of the company's common stock above \$70 as when the sale of subsidiaries.

BENEFICIAL Corporation, a Delaware shared insurance and consumer finance group, is making a \$150m after-tax provision to cover losses on its reinsurance business and has asked its investment banker to review ways of maximising shareholder value, including the sale of the company.

Beneficial's directors have authorised the company's management and First Boston to evaluate thoroughly the "full range of tactical and strategic alternatives that would enable us to maximise value" for shareholders. The alternatives which may be implemented.

The Delaware group, which is directors have authorised the company's management and First Boston to evaluate thoroughly the "full range of tactical and strategic alternatives that would enable us to maximise value" for shareholders. The alternatives may include the sale of Beneficial's directors have authorized employment contracts for certain officers of the company's management and First Boston to evaluate thoroughly the "full range of tactical and strategic alternatives who are, and will be, instrumental in successfully achieved for shareholders. The alternatives may be implemented.

The Delaware group, which are call in successfully achieved for shareholders.

The Delaware group, which are call in successfully achieved for shareholders. The alternatives may be implemented.

The Delaware group, which are call in successfully achieved for shareholders. The alternatives which may be implemented.

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The Delaware group, which are call in successfully achieved for shareholders.

The Delaware group, which is called the company's management and First Boston to evaluate thoroughly the "full range of tactical and strategic alternatives which may be implemented.

Base value of all Indices are 100 except Brussels SE—1,000, JSE Gold—255.7, JSE Industrial—254.3, and Australia. All Ordinary and Metals—500 NYSE All Common—50: Standard and Poors—10: and Toronto Composite and Metals—1,000. Toronto Indices based 1975 and Montreal Portiol: 2.4/1,83 † Excluding bonds. # 400 Industrials plus 40 Utilities. 40 Financials and 20 Transports. c Closed. u Unavariable.

NYSE COMPOSITE CLOSING PRICES

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NEW YORK STOCK EXCHANGE COMPOSITE CLOSING PRICES

34633632653394566365657236563636311473625454586539375956654753555738861522325611416653655367223661 19.20 15.20 Kidder, Peabody International International Investment Bankers

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COMPOSITE CLOSING PRICES | 12 | Manuta | 12 | Manuta | 13 | Manuta | 14 | Manuta | 14 | Manuta | 15 | Manuta | 15 | Manuta | 16 | Manuta | 16 | Manuta | 16 | Manuta | 17 | Manuta | 18 | Manuta | See | High | Hig | Stack | Div. | Yal. | E | Yal.

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ChilChi
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Nasdaq national market, closing prices

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FINANCIAL TIMES WORLD STOCK MARKETS

WALL STREET

Caution over Fed efforts on economy

US FINANCIAL markets traded cautiously yesterday as Wall Street assessed the implications of the efforts by the Federal Reserve Board to stimulate a flagging domestic economy, writes Terry Byland in New York.

The major stock market indices were depressed by profit-taking in motor, pharmaceutical and chemical stocks. But selling was moderate, and the technology sector remained firm.

After opening sharply lower, stocks rallied at mid-session, only to fall back to end close to the day's lows. The Dow Jones industrial average ended a net 16.03 points down at 1871.77.

In the credit markets, short-term rates drifted lower, with market analysts, notably Dr Allen Sinai of Shear-

Stock markets in the UK and Hong Kong were closed yesterday for public holidays.

son Lehman, arguing that the Fed would cut its discount rate again some time this autumn – with or without accompanying action by the other major trading nations.

Bond prices, subdued at first by wor-

ries over the possible inflationary effects of the Fed's actions, rose sharply towards the close to show gains of % point.

Weakness in General Motors, down

Weakness in General Motors, down S% at \$72%, Merck, \$2 off at \$111%, Du Pont, \$1% off at \$80%, and Procter & Gamble \$1% off at \$77%, depressed the major indices.

But a Merrill Lynch recommendation for IBM took the stock up \$1% to \$139% in brisk trading, and some other technology issues also brightened.

Digital Equipment gained \$1½ to \$101, and Burroughs at \$73% added \$% as the Burroughs/Sperry merger came on stream. But Honeywell, still unsettled by the disclosure that Sperry considered making a bid, eased \$% to \$71.

Wall Street's unhappiness with General Motors was fuelled by the car group's offer of retirement incentives for white-collar workers – it wants to slash this workforce sector by 25 per cent by 1989. But other Detroit car shares also ran into profit-takers. Ford, the most fa-

voured motor stock in recent weeks, was \$\% down at \$61\%, and Chrysler lost \$\% to. \$40\%.

Major airline stocks rose smartly on the news that People Express, the fare cutter, may put its Frontier Airlines unit into bankruptcy law protection, as United's plan to buy Frontier crumbles in the face of negotiations with the pilots' union.

At \$4% People Express was unchanged, but Wall Street's view of the case was revealed in a jump of \$2 to \$55 in United shares.

Other domestic airline issues firmed at this sign of distress among the fare-cutting rivals, but Pan Am remained flat at \$5%.

But once again, the market was featured by a number of takeover and special situation stocks.

There was another session of heavy

turnover in USX, the former United Steel, the shares dipping \$\% \tau \text{519} as the market awaited further comments from Mr Robert Holmes à Court, the Australian entrepreneur who is taking a stake in the steel company.

The most active NYSE stock was ICN

Pharmaceuticals, down \$6% at \$21% after adverse comments on the stock and its Virazole drug in the investment press. Two quoted subsidiaries of ICN also ran into sellers, Viratek tumbling \$18 to \$51 and SPI Pharmaceuticals \$6% to \$26%.

Also weak was Beneficial Corp, \$% off at \$72% in heavy trade after the board's decision to sell the company was believed to have attracted active interest from a host of major names, ranging from Ford, GM and Chrysler to Manufacturers Hanover and some foreign banks.

Despite expectations that prime rate would have to be lowered soon, bank stocks remained steady. J. P. Morgan shed \$% to \$92%, but Chase Manhattan at \$42% edged up \$%.

In the credit markets, federal funds climbed to 5% per cent bringing \$1.5hn in customer repurchases by the Fed. Treasury bill rates shaded by two basis points.

CANADA

WEAKER OILS offset most of the early gains in active Toronto trading.

Total Petroleum North America traded C\$\% lower at C\$25\%, Shell Canada dipped C\$\% to C\$21\% and Dome Petroleum gave up 5 cents to C\$1.25.

Alcan managed a C\$% rise to C\$41% as it detailed the Norsk Hydro plan to purchase five European aluminium extrusion plants from the group.

Industrials in Montreal showed the argest declines.

EUROPE

Banks lead way to fresh peaks

ANOTHER PAIR of records was managed on the European bourses yesterday despite the slower pace of trading induced by the holiday season. European bank shares, however, staged a broad advance on the hope of lower interest

Brussels edged higher to a new peak in thin trading that reflected the absence of many British investors. The Belgian Stock Exchange index added 0.32 to 3,866.08. Banks and retailers were the firmest sectors as holding companies and industrials tended mixed.

Merger rumours continued to trigger demand for UCB, up BFr 20 to BFr 9,030, while Solvay, linked with the UCB speculation in the past, fell BFr 50 to BFr 7,930.

Market beliwether Petrofina slipped BFr 70 to BFr 8,990 on news that its American subsidiary planned a major capital increase through a one-for-10 share offering within the next month. Reserve gave up BFr 40 to BFr 3,090, and FN, the sports goods to arms maker, dipped BFr 30 to BFr 2,080.

Madrid demonstrated a more dynamic run-up to a new peak as the Bourse index rose 2.55 to a record 196.47, mainly on the strength of the banks and telecommunications sectors.

Particularly active trading boosted Banco Popular 65 percentage points to 1,425 per cent of nominal value, and Vizcaya jumped 40 points to 1,600 per cent. Ten-point gains were registered by both Banco Hispano at 435 per cent and Banco Santander at 780 per cent.

Telefonica led the communications sector higher with its 1½ point advance

Petroleos was one of the few shares to move against the trend as it shed 2

move against the trend as it shed 2 points to 347.50 per cent.

Frankfurt was dominated by domestic buyers as overseas support evaporated.

Speculation persists that the Bundesbank will cut its rates soon, and bank stocks were quick to respond with large gains. The Commerzbank index, heavily weighted with banking constituents, rose 11.2 to 2,102.2.

Commerzbank led the way with a DM

Commerzbank led the way with a DM 13.50 jump to DM 349.50 ahead of its Tokyo listing presentation, Deutsche Bank

closed DM 4 up at DM 850 and Dresdner at DM 456.50 was DM 2 higher.

Car makers continued to draw support, with BMW up DM 11 at DM 623 while Daimler put on DM 9 to DM 1,315.

The bond market was quiet due to the lack of British support and the easier tone in the US credit markets on Friday.

Prices lost up to 10 basis points.

Opinion is still sharply divided over Bundesbank intentions on rates.

Many see Thursday's fortnightly meeting of the central bank's policy-making council as the stage for the next cut in the discount rate, currently 3.5 per cent, and the Lombard rate, now at 5.5 per cent. Other observers see early September as the earliest move

The Bundesbank yesterday bought DM 32.5m worth of domestic paper Paris recorded its 11th consecutive gain on the conviction that interest rates

as the cosmetics group detailed a FFr

would fall shortly.
L'Oréal picked up FFr 5 to FFr 3.644

West German companies are expected to float a record volume of new shares this year after new-issue volume in the first half more than doubled last year's comparable figure, according to Deutsche Bank. Domestic groups issued DM 7.1bn of new shares in the first six months compared with a total DM 9.3bn

1.4bn capital increase, 60 per cent of which will be allocated to foreign investors.

Amsterdam moved lower in slow trading, and the ANP-CBS General index lost 2.2 to 293.7. Unilever, still in pursuit of Naarden International, fell Fl 2.50 to Fl 515.50 while Fokker lost Fl 1.60 to Fl 68.50.

Stockholm lost ground. Ericsson, most active, retreated SKr 3 to SKr 231 ahead of results due this week while Electrolux, also active, fell SKr 4 to SKr 305. Atlas Copco shed SKr 10 to SKr 211 on consideration of its slightly firmer half-year statement.

Milan finished mixed, and Zurich was steady.

SOUTH AFRICA

for all of 1985.

MODERATE local demand prompted another record in Johannesburg although the closure of the UK market for a holiday dampened overall activity. Steady support for gold and industrial

Steady support for gold and industrial issues was evident, and the All Gold index jumped 20 points to a record 1,669 while the broader market index peaked with a 12-point gain to 1,838.

Among blue-chip golds Vaal Reefs added R2 to R322, and Buffels at R101 was R1.50 higher.

TOKYO

Rate hopes fuel record one-day gain

INSTITUTIONS and individuals were energetic buyers of stock in hectic To-kyo trading which saw the Nikkei market average post its largest ever single day upsurge, writes Shigeo Nishiwaki of Jiji Press.

The index rose 432.78 to 18,565.61, re-

The index rose 432.78 to 18,565.61, recouping more than half the steep loss seen in the previous three trading days. The sharp advance was attributed to expectations of a cut in interest rates and a resultant rise in stock prices.

Large-capital steels, shipbuildings, heavy electricals and power companies drew particularly heavy buying. Domestic demand-related issues, trading houses and financial stocks also gained on a broad front.

The market average had chalked up a 505-point upsurge at one stage in the afternoon. Volume shrank from 1.9bn shares on Friday to 1.2bn reflecting a hesitant mood at the start of the session. Gainers outpaced losers 598 to 206, with 117 issues unchanged.

The rapid rise in stock prices and a sharp rally in crude oil prices made investors wary last week, leaving the Nikkei average down 803 points in the three days from Thursday. But yesterday many institutional investors saw a good opportunity to buy, and individual investors followed their lead.

Leading brokerage houses said there was no factor supporting such a sharp rebound and that the active purchases mirrored the massive surplus funds of institutional investors.

Large-capital stocks were at the centre of attention, with institutional investors stepping up their purchases. Trading in the 10 most active issues accounted for as much as 61.7 per cent of the total volume.

Nippon Steel, at the top of the actives

list on 175.24m shares traded, added Y20 to Y257, a record high. Kawasaki Steel came second with 173.74m and rose Y24 to Y264 while Nippon Kokan and Mitsuhishi Heavy Industries climbed Y24 to Y301 and Y32 to Y627, respectively.

Among heavy electricals, Toshiba mit

Y301 and Y32 to Y627, respectively.
Among heavy electricals, Toshiba put on Y21 to Y695. Hitachi and Mitsubishi Electric were each Y10 up at Y1,040 and Y505, respectively.
Utilities advanced, with Tokyo Elec-

tric Power rising Y340 to Y7.060 and Tokyo Gas Y35 to Y885. Trading houses scored conspicuous gains. Mitsubishi jumped Y80 to Y1.200, Mitsui Y45 to Y783 and C. Itoh Y59 to Y599. Nissho Iwai closed Y70 higher at Y574. Observers noted that these issues were cheaper

than large-capital stocks.

Financial stocks and blue chips were higher. Tokio Marine and Fire finished Y120 up at Y1,770, Sumitomo Bank Y160 up at Y2,290 and Nomura Securities Y120 higher at Y3,320 NEC advanced Y80 to Y1,820, JVC Y60 to Y2,440 and Canon Y40 to Y990.

Kajima moved up Y50 to Y1.160 and Taisei Y30 to Y710 while Mitsubishi Ea-

tate added Y80 to Y2,350.

In the bond market, dealers remained on the sidelines, and prices dipped. Although institutional investors and dealers are bullish about the future price trend, sharing the view that Japan and West Germany will carry out concerted interest-rate reductions in September, they apparently decided not to buy actively in view of the fast rise since the beginning of the month.

The yield on the benchmark 6.2 per cent government bond maturing in July 1995 rose from 4.565 per cent on Saturday to 4.575 per cent.

AUSTRALIA

RISING DOMESTIC interest rates and a softer gold price subdued Sydney trading and trimmed 4.2 off the All Ordinaries index to 1,179.1. Turnover slipped to 54m shares compared with Friday's

BHP staged a late rally to finish the day 4 cents cheaper at A\$7.80, after trading at A\$7.66, and Bell Resources retreated 8 cents to A\$5.04 after an early A\$5.

Banks were under pressure, with ANZ off 7 cents to A\$4.78, National 2 cents to A\$5.34 and Westpac 1 cent to A\$4.85.

Among stronger oils Santos gained ? cents to A\$3.75.

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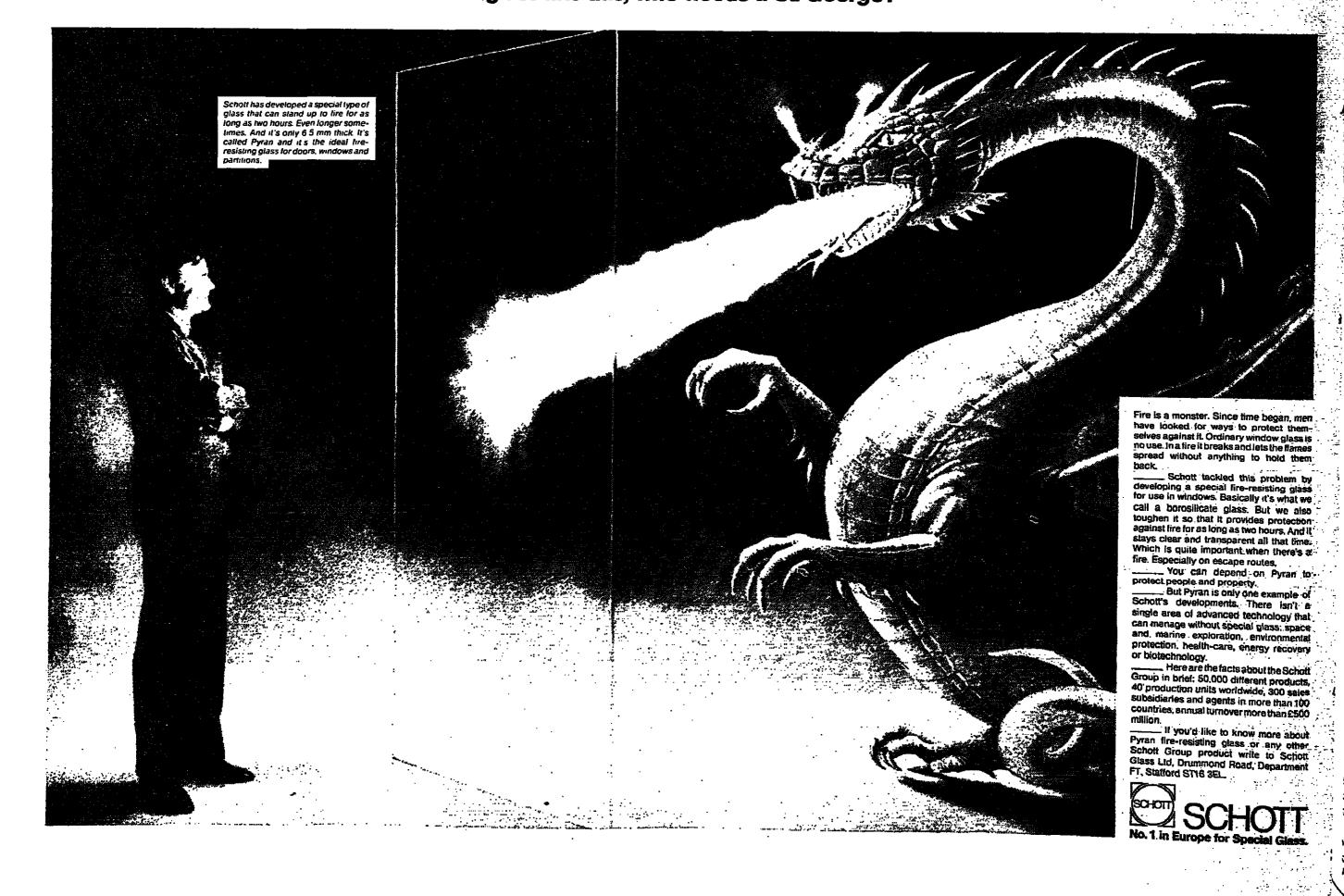
SINGAPORE

A NERVOUS start to Singapore trading was overcome as blue chips rallied in response to the news that Malaysian businessman Tan Koon Swan had pleaded guilty to charges of abetting in a criminal breach of trust relating to the collapse of Pan-Electric Industries.

lapse of Pan-Electric Industries.

Long neglected Malaysian issues were also bought as a result, partly reflecting market sentiment that the Pan-Electric affair was almost over. The Straits Times industrial index added 2.45 to 813.79 on lower volume of 22.4m shares.

With glass like this, who needs a St. George?



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Financial Times Tuesday August 26 1986

SECTION III

FINANCIAL TIMES SURVEY

Aerospace

The overall long-term outlook for the world's aerospace industries remains bright, despite severe current problems in some areas, such as airline finances, pressures on some defence budgets, and difficulties with the US space programme.

Pace likely to accelerate

dustries gather for the biennial atmospheric vehicle" will have Farnborough Air Show, starting to be taken. next Sunday, in the knowledge that for the rest of this century the pace of their activities is likely to accelerate rather than

dollar civil and military aircraft, engine, guided weapons and space programmes are already under way, and will come to fruition in the years ahead, many other new ones are in the conceptual or early planning

As these mature, they will provide massive additional workloads, while also driving the frontiers of technology further forward.

In the UK alone, several major decisions are pending. For civil aircraft these include participation in the new Euro-pean Airbus A-330 high-density A-340 four-engined long-range transport programmes.

In military aviation, full-scale development of the four-nation Eurofighter will be sought around the middle of next year, while before then a will have to be taken on the future of the Nimrod airborne early warning aircraft

copter and the possibility of the multi-national European NH-80 belicopter for the 1990s

THE WORLD'S aerospace in- and Landing (Hotol) "trans- of this century.

UK Government financial involvement in all these ventures will be such that the scope and style of the Government's management of its investments will also need to be reconsidered. The Commons Defence Committee has already urged that a Ministerial Aerospace Board should be considered as a means of co-ordinating government involvement in aerospace Although some arenas, such as civil aviation, are more sen-

others, overall the trend in aerospace and related spending is likely to be upwards, the rates varying according to region and short-term develop-ments — although the latter may be of less significance than they may immediately appear.
The difficulties encountered by some airlines on the North Atlantic routes this summer,

By Michael Donne, Aerospace Correspondent

and of avoiding future political imbroglios such as that sur-

broad aerospace industry approval, for the kind of disarray experienced last winter does no section of the industry any good since it lowers confidence in the Government's ability to handle the industry's complex affairs expeditiously and efficiently.

All the ventures outlined will be critical to the full exploitation of the UK's industry's own skills and resources through to the end of this century, if it is

total Western world markets for aerospace and related equipment — civil and military will have to be settled. And aircraft, engines, guided term benefit to the consumer in space, decisions on involve, weapons, spacecraft and avio-but of dubious long-term value ment in such wantines as the nike—will amount collectively to the stability of the air transprojected Horizontal Take-Off to some \$1,400hn by the end port industry.

for example, through the slackening of US traffic to Europe, is not likely to be a long-term problem, although it may have an immediate impact on some airline balance sheets and even slow some re-

equipment programmes.

More significant longer-term problems are likely to be the continued over-capacity on North Atlantic and elsewhere, which can be corrected only by the airlines themselves exercising tighter control over their own scheduling, and the need for a more measured pace in the expansion of deregulation.

programmed in the little share of growing to win its share of growing In helicopiers, future particle world markets for aerospace pation in the joint Anglo-litalian A-129 light attack heli. It has been estimated that trates the damage that can be caused by unbridled deregula-tion and its consequent fares wars, which may be of short-

accounts in turn for much of the hostility that pressures for deregulation arouse. That de-regulation is inevitable is becoming more widely accepted, although there is still a considerable way to go. There are still some considerable differences of view over the pace at which it should be imple-

Nevertheless, in commercial aviation, all the major manufacturers agree that between now and the end of the century there will be a massive market for jet airliners amounting to more than \$250bn, and accounting for upwards of 5,500 new aircraft of all kinds.

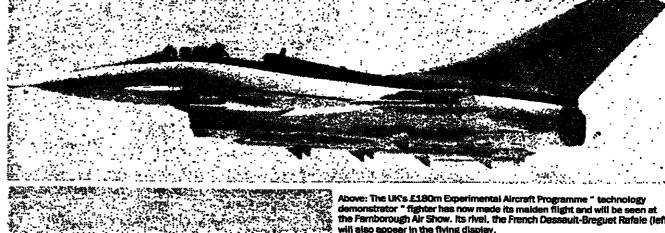
These will be needed both to replace existing ageing fleets and to meet traffic growth. In addition, there will be a major demand for smaller aircraft to meet the growing needs of the commuter and regional aviation

General aviation, which includes the business aircraft sector as well as the provision of light aircraft for other purposes including leisure flying, has been slower to expand in recent years.

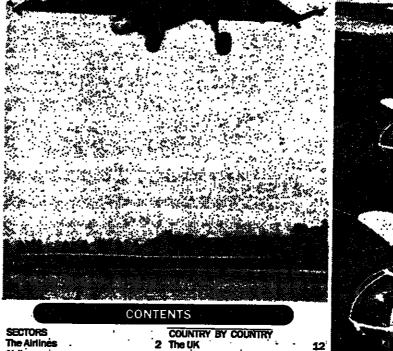
Manufacturers, especially in

the US, have been seriously affected by such problems as the increasing costs of product liability insurance, stemming from rapidly-escalating court awards in liability litigation. This has so inflated the prices

CONTINUED ON PAGE 2



the Famborough Air Show. Its rival, the French Dassault-Breguet Rafale (left

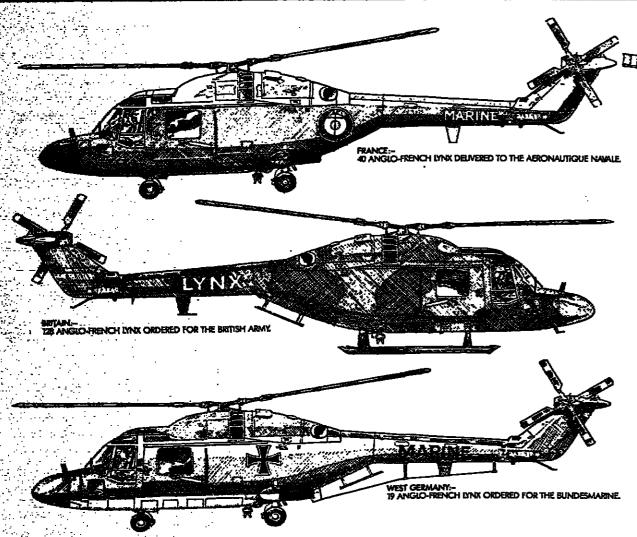


New shapes



WESTLAND

Famous for its European Lynx. (And its European links.)

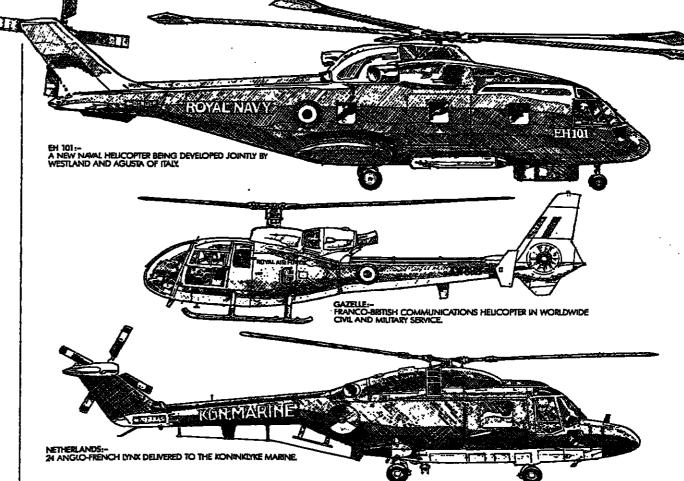


Lynx is the name of one of the world's most successful helicopters. It's also the result of just one of Westland's highly successful international collaborative ventures.

Over the last nineteen years, Westland have worked with Aerospatiale of France to produce not only the Lynx, but also the Puma and the Gazelle. And that's just one of our international links.

We've been in partnership with Sikorsky, to take another example, since the Second World War. Out of that pool of expertise and experience have emerged such well-known names as Dragonfly. Wessex, Whirlwind and Sea King. And now we're working together more dosely than ever to produce the new Black Hawk helicopter.

Agusta of Italy are another company with which



Westland have longstanding and strong ties. Now Westland and Agusta have joined forces to design and build NATO's major naval helicopter for the 1990s, the EH101.

Westland is working with companies in five European countries on two new helicopter projects, the NH90 and the Light Attack Helicopter. We're involved in advanced airborne technology and

hovercraft. And we're constantly working on new projects for the future. We call it team technology. And it works.

Pace is likely to accelerate

and manufacturing techniques.

In space, the tragic disaster to the Challenger Space Shuttle last January has substantially delayed further US manned

space flights for commercial

and military purposes, and as a result also the eventual development of the next big US manned space venture, the

With the expenditure of

money, energy and time, the US space programme will eventually get back on track. The US Corporation

The US Government decision to build a fourth "Orbiter" Shuttle

spacecraft is bound to help in

this direction. Space activities are vital for the long-term development of technology

some rivalry with the US. in effect those involved in the

And new ways of flying, such

Space Station.

CONTINUED FROM PAGE 1

of small light aircraft as to drive down sales and threaten the viability of some manufacturers. Legislation to regain some control over this situation is now pending, but it remains a problem that every world aerospace manufacturer of civil aircraft views with concern, especially if he is exporting to

the US, as most are.
In military aviation, pressures
on some defence budgets, including the UK, have either resulted in, or threaten, some near-term reductions in military aerospace spending, and the possibility of some further constraints, such as more stringent sifting of plans for

new projects, may emerge. However, in the long-term, overall spending on defence in the non-Communist world seems likely to grow between now and In Western Europe, despite some problems with the Ariane launch vehicle, the space industry has matured rapidly,

Description of the Space industry has matured rapidly, and Ariane itself is being called on to play a bigger role in satellite launching pending the return of the Space Shuttle.

At the same time, there are ambitious further development plans for Ariane, to enable to launch bigger role in the same time, there are ambitious further development plans for Ariane, to enable to launch bigger eventually the same time, there are ambitious further development to launch bigger eventually the same time, there are ambitious further development to launch bigger eventually the same time, there are ambitious further development to launch bigger eventually the same time. there are plans for new Advanced Tactical fighters for both the US Air Force and Navy, and an Advanced Technology Bomber (ATB) for the USAF.

Western space programmes will also continue to work closely together — especially, for example, on Space Station, for Europe could never afford such expensive ventures on its own. Another major expanding aerospace market is avionics, now a multi-billion dollar business worldwide. About one-third of the value of all one-third of the value of all in all these arenas, the civil and military aircraft, advanced technological nature civil and military aircraft, advanced technological nature engine, guided weapons and of the new ventures envisaged space is accounted for by is in turn forcing many equipment of all kinds, of advances in industrial and which in turn avionics—airborne electronics — ranging from new materials such as from radars through to navigation and flight control systems methods of manufacturing and envidance systems—accounts tion and flight control systems and guidance systems—accounts handling such as super-plastic forming, diffusion bonding and

for a substantial proportion.
In turn, the increasingly stringent performance demands of modern aerospace vehicles as are placing ever more severe pressures on the avionics industry. Avionics is already the spearhead for the entire electronics industry, and the the spearhead for the entire electronics industry, and the technological advances now taking place will be just as far-reaching in their impact on other industries as those other developments occurring in such the entire the way.

Outside the major aerospace in far from it, for investments already the union, the UK, Western Europe likely to be more aircraft their continued undevelopments occurring in such fastest method of advancing a the next century.

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nation's technological capabilities, and more and more countries are promoting the development of aerospace indus-tries, especially in the Third World, and especially in South

East Asia.
One of the most significant developments over recent years, and one of which many of these smaller countries are now taking advantage has been the growth of international collaboration on a wide variety of aerospace ventures, despite the continuation of fierce competition.

This covers the entire acor space spectrum. In commercial aircraft, Airbus Industrie in Western Europe is the prime example. In aero-engines, the five-nation consortium, International Aero-Engines, building the V-2500 engine for the European A-320 Airbus, is strong evidence of the trend.

In military aviation, the forthcoming Eurofighter and the

current Tornado combat aircraft also illustrate the trend, while the European Space Agency, the Franco-German Euromissile group, and the Anglo-Italian EH-101 helicopter venture are all excellent examples of what international collaboration in international collaboration in aerospace can achieve.

across a wide spectrum of aero-space and related activities, and the West as a whole would be damaged by lengthy delays in US space ventures. As the costs of individual aerospace projects continue to soar into the multi-billion dollar bracket, collaboration as a means of widening markets and sharing the costs increas-ingly will dominate the world

erospace industry.

There have even been suggestions of much wider Euro-pean-US collaboration, for example between Airbus Industrie and McDonnell Douglas of the US, on the next generation of long-range airlines, as a means

ong-range airlines, as a means of reducing competition.

Both sides have played down the significance of their discussions, but the possibility of such collaboration is still there, and over the next few weeks it could well become a live issue once again. issue once again.
One of the most significant of

all current aerospace develop-ments, which could have far-reaching implications for the future course of civil aerospace manufacturing, is the emerg-ence of the prop-fan as a prime airliner power-plant. The claims for this concept of

propulsion, discussed elsewhere in this survey, are about to be tested in flight by major US aerospace companies. If they are seen to be justified, and prop-fan engines are pushed forward, the turbo-fan (jet) engine as we know it today could face severe competition.

as "fly-by-wire," using elec-tronics to control aircraft manoeuvres, with "fly-by-light," the use of fibre optics are on This does not suggest that the jet engine is on the way out: far from it, for the massive investments already made or likely to be made in iet. powered aircraft will ensire their entitled. their continued use well into

Bleak outlook as traffic growth slows

with traffic rate in mar on the No but with ca

Earlier t Eser, dire potentially in terms were met: that the drop in crude oil prices was passed on by the oil companies in equivalent reductions in the price of jet fuel, and that capacity increases were in line with projected traffic growth.

More recently, in the light of the first six months' results. Mr Eser was more pessimistic and said that neither of these two conditions had been achieved. As a consequence, it now seemed very unlikely that there would be any improvement over last year.

Indeed, the latest data from members confirms that pros-pects for profitability this year have dropped sharply in the past three months for many carriers. There are exceptions, of course, but in general, the trend is down, though fluid.

"We estimate that, at best, the industry could show a break-even result this year or possibly a marginal profit. At worst, the losses could amount to \$1bn or more."

This contrasts with a system-wide profit by IATA's 144 air-lines last year of \$900m after tax, and profit of \$600m on international scheduled services Mr Eser went on to point out

that the possibility of profits depended on what savings on fuel costs actually occurred, and on how traffic growth recovered as the summer "On the fuel side, while prices have come down sub-stantially in certain highly-

competitive supply locations like London, New York and Paris, on the whole the scale of reduction has been far short of the drop in crude oil prices. "For example, in the 12 months to the end of May, crude oil prices fell by about 55 per cent. Jet fuel prices, however, as reported by members to us, showed an average reduction of

THE FINANCIAL outlook for the world's airlines is bleaker than at any time since the World total international and domestic revenue traffic recession of the early 1980s, (Scheduled services of sirlings of ICAO Contracting States)

c growing at a slacker	(Semi	-ume	A SELATE	es vi aliti	nes of v	AU U	naftatrn	R orare	•7				
any regions, especially lorth Atlantic routes, apacity growing at too rate, so that revenue edeclining.		—Pa:	Annual increase (%)	Passen	ger-km	Freigh	t tonnes Annus i Incresse (%)	Freight 1			Annuel Increase (%)	th ——besto	mied Annua Increal (%)
this year, Mr Gunter ector-general of the mai Air Transport in, suggested that 1986 y could be a good year of airline industry	1976 1977 1978 1979 1980 1981 1982	610 679 754 748 752	7.9 5.9 11.2 11.1 -0.8 0.5	764,000 818,000 936,000 1,060,000 1,089,000 1,119,000	9.5 7.2 14.4 18.2 2.7 2.7	9.8 10.6 10.6 11.0 11.1	7.5 7.6 5.7 3.5 0.8 -1.6	21,540 23,630 25,940 28,016 29,280 30,880	11.2 9.7 9.8 5.9 4.9 5.1	3,630 3,189 3,270 3,429 3,680 3,800 3,880	4.5 4.8 2.8 4.9 7.5 3.1 2.1	93,260 100,440 113,540 126,860 130,980 135,490 138,400	10.9 7.7 13.9 11.7 3.3 3.4 2.1
to if the condition.	1352	103	1.6	1.142.000	2.0	31 G	6.6	31.540	2.1	0,00V	-	********	

1983 795 1984 841 1985 891 Source: ICAO.

4.0 1,187,000 5.8 1,271,000 6.0 1,360,000

On the capacity side, air-lines have continued to put more seats onto many routes. despite the sharp slackening in traffic growth. Mr Mike Brown, assistant director of management information at IATA, has said that "the gap between capacity and demand is continuing to grow at a high rate, particularly on the Atlantic, where capacity from North American carriers alone has grown by 20.8 per cent."

The danger facing the air-lines is that the windfall of cheaper fuel prices, where they have occurred, could be wiped out by falls in revenue yields stemming from over-capacity.

"If yield dips by one per rentage point (industry-wide) profit levels will drop by \$400m." Mr Brown says. Looking further ahead, 1987 could be a little better, but not much. In Mr Brown's view: "Most carriers will break even, but they will be the lucky oner." they will be the lucky ones. The North Atlantic situation

continues to trouble many European airlines, especially those in the UK, for they depend on that route substantially for much of their revenues, British Airways earns about a quarter of its revenues from North Atlantic operations. British Caledonian over 30 per cent and Virgin Atlantic close to 100 per cent. to 100 per cent. In the early summer,

only some 20 per cent for the same 12 month period.

"We expect there are still some further savings to come in certain markets which usually react slowly in passing on such reductions, such as Japan."

On the capacity side, airlings have centify side, airlings have centify side. 5 per cent annually of the immediate past, and it still seems likely that short of any unforeseen economic or other disasters, the level of some \$21m personners covered such as the second state. combined to depress originating Atlantic traffic.

Efforts by the UK and European governments, airlines and travel trade have been only partially successful. While by mid-July there were reports of an upturn in bookings on the North Atlantic, they could not compare to the damage. compensate for the damage already done to airlines' balance sheets in the early summer months, and at best airlines will show reduced profits for the summer if not actual losses,

The impact could be serious for some airlines, which depend on summer profits to see them through the bleaker winter months and to produce overall profits for the financial year.

however, could be one of the biggest headaches for airline For example, without this summer income, British Airways, in its run-up to privatisation, could be in some diffimanagements for many years. The IATA view is that the air-line industry's profits just will not permit re-equipment on the scale that the manufacturers themselves seem to think will occur, and that the sirines culty. Its 1985-86 balance sheet showed that in the second six months to end-March, it only broke even, so that its overall profit for the year was due entirely to the profits it earned themselves recognise must occur as more and more existin the summer of 1985. However, in recent weeks BA inefficient and too expensive to

has shown more optimism, with Mr Colin Marshall, chief executive, reporting that "there have been a number of indi-cations from around the world that the worst may be over, and that our business is return-

with associated heavy interest charges, versus leasing are al-ready being debated long and hard in many airline board-rooms, and it is certain that more and more airlines will opt for the latter method of financing their ficets in the years. The growth of leasing to meet the airlines' own supanding fleet requirements for jets that in themselves become over more costly (one new Booleg 747 jumbo can now cost well over \$100m) is one of the major 145,969 158,310 166,570

recent developments in the acrospace industry. In some cases, these leading organisations have grown to large and powerful that they can place some of the biggest orders ever seen for the aircraft—one example being the recent \$2.75bn order by the GPA Group of Shannon for oper 100 jet airliners from Booing and McDonnell Douglas.

It seems likely through the years ahead that fewer and fewer airlines will resort to buying aircraft, with the attendant heavy burdens of and other financing institutions, and will turn more to leasing. Debt repayments by the airlines have been increasing, from around \$15m in 1980, to reach \$1.7m in 1984 and \$1.6m in 1985, with a comparable figure likely for the current year.

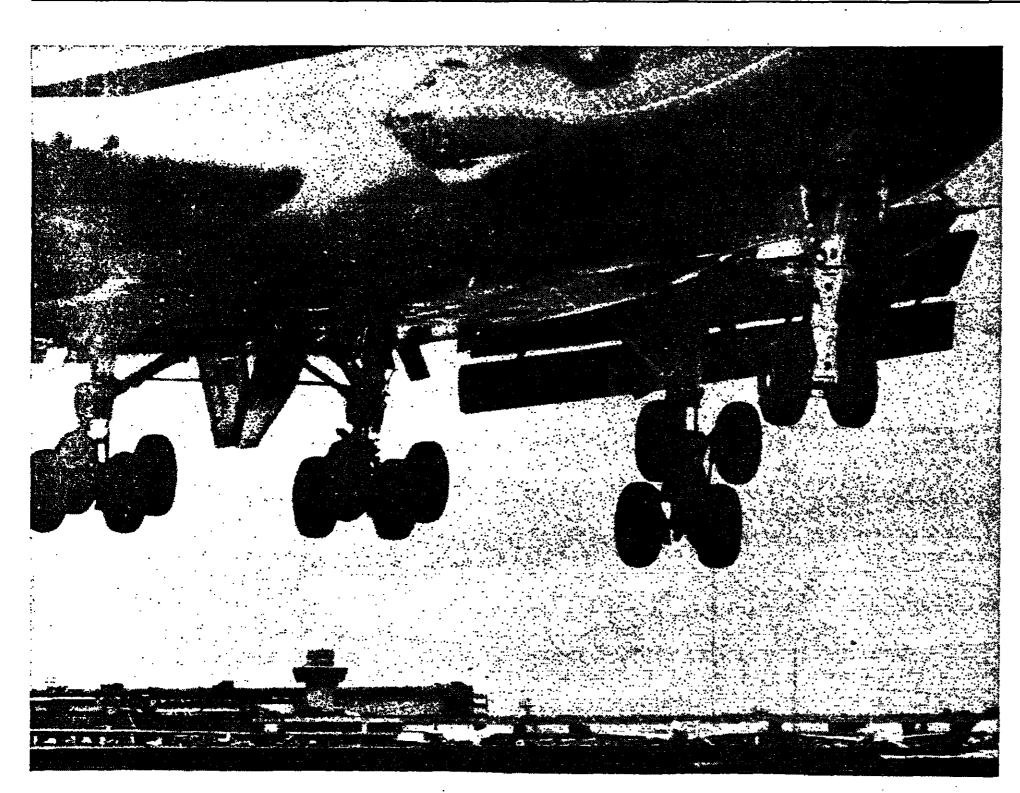
It has been estimated by the LATA that depending on the

It has been estimated by the rate at which traffic grows, the IATA member airlines alone will need to invest between \$150bn and \$200bn in new equipment over the next decade, which in turn indicates that they will need to earn average proposition profits before interest. operating profits before interest of at least 7.5 per cent which, allowing for tax, rises to 10.5

The airlines are currently not The airlines are currently not earning that level of profit. In fact, as IATA says, their return on investment and turnover is totally inadequate for the massive re-equipment. Programme before them. Many airlines are already over borrowed, and will face increasing difficulties in finding additional finance to meet their needs. needs.

The alternative to direct procurement seems likely to be Leasing, rather than buying is now prebably the only way out of their problems unless asing in one form or another, which could provide a cheaper option than making direct loans through banks and other their governments come to their sid with preferential loans.

Michael Donne



Today's high volume of air-traffic may be shrinking the world but it's increasing the challenge facing air-traffic

891m passengers carried world-

wide (including the Soviet Union and China) during 1985

will double by the end of the century, if not before.

It is this longer-term traffic expansion that the world's air-

craft manufacturers have in mind when they make their assessments of fleet expansion.

assessments of neet expansion, amounting to outlays upwards of \$250bu on new jets by the end of the century, for upwards of 5,500 aircraft, both to meet fleet replacements as well as

traffic growth.
Paying for all this equipment,

maintain through sheer age.

A challenge the Cossor Monopulse SSR system is uniquely qualified to meet:

The dramatic reductions in signal interference, trackwander and 'garbling' obtained with our Monopulse SSR system makes the job of controlling high density air-traffic that much easier. Our LVA (large vertical aperture) antenna gives further benefits by radically reducing ground reflections.

Our Monopulse SSR system enables the air-traffic controller to plot more accurate flight paths and, in high density traffic, to use the air space more efficiently to save valuable fuel. All of which reduces the work load of the controller himself.

In Britain the Civil Aviation Authority was quick to recognise the potential of Monopulse SSR. As part of it's major radar replacement programme 22 Cossor systems are being installed - a network that covers the entire UK.

The RAF — established customer for our IFF and precision approach landing radar - chose Cossor again in ordering Monopulse SSR installations for its stations in the UK and Germany. The vast air-spaces of Canada, the desert skies of Saudi

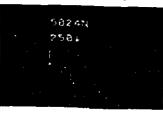
Arabia, Dubai and Bahrain, and the mountainous approaches to Geneva are coming under the control of our system. Additionally, you'll find Cossor Monopulse SSR systems being installed in Greece, China and Australia. No other system is meeting with such international acclaim.

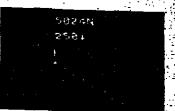
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ocuracy obtained with the Cossor-Monop Left: An aircraft track obtained by conventional SSR. Right: The same track obtained by Cossor Monopular





Cossor Monopulse SSR now brings you down safely in four continents.

A **Rayfheon** Company

Airliners

Re-equipment tide flows strongly

THE WORLD'S major airliner manufacturers are having a good year, as airlines progressively either phase out existing ageing fleets and acquire replacement aircraft, or re-equip to meet the substantial traffic growth anticipated between rener growth anticipated between now and the end of the century.

This re-equipment tide is flowing despite some airlines' cash difficulties stemming from cash dimerities stemming from currently poor financial results. But the fact that they are still able, and anxious, to acquire new equipment indicates both their own determination not to be left behind by the competi-tion, and the confidence of the lending institutions in the air transport industry's long-term viability.

Boeing, the world's biggest newing, the world's niggest airliner manufacturer, logged new firm orders for 242 aircraft in the first six months of this year, worth \$12.60n, compared with last ways? with last year's first six months' total of 77 aircraft, and the full 1985 total of 390, worth \$14.96bn.

Both Airbus and McDonnell Douglas, Boeing's rivals, have also done well, while there has also been a steady inflow for smaller, commuter and regional types of airliners, such as the SAAB 340, now being delivered, and the new Fokker F-100 and

With the second half of the year, customarily a stronger period for new orders than the first half, and with many air-lines currently known to be first half, and with many air-lines currently known to be negotiating major new commit-ments, it seems likely that for

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Standard Barton

World Market for Jet Airliners (to 2000)

the whole of 1986, the manufacturers cumulatively will match, if not exceed, last year's total of 682 new jet airliners alone firmly ordered, worth about with orders for turbopropeller commuter regional airliners additional to

Western Europe). This growth, the makers believe, together with the increas-

some airlines and some short-

North Atlantic as a result of

US visitors staying away from

Boeing, for example, believes that between now and the year 2000, the sirlines will spend up to \$245hn on new jets, of which \$172bn will be for traffic growth, and \$74bn for replacements.

Boeing bases these estimates on a world average annual passenger traffic growth rate of about 5.5 per cent over that period. It puts the number of aircraft involved at about 5,655 jets, which after allowing for retirements of 2,920 means a net gain of 2,740 jets from the end-1985 fleet total of 6,690 to a total of 9,430.

McDonnell Douglas suggests that up to the end of the century, a total of about 5,485 new jet airliners will be needed, worth about \$250bn, and it also believes that passenger traffic will grow by an average of about 6.3 per cent a year.

Airbus Industrie, whose fore-casts rum to the year 2005, suggests a more optimistic total of close to 9,000 new jet airliners, which, after discount-ing existing orders and fleet retirements means a total jet fleet by that time of some 7,850 aircraft. It also bases its forecasts on a broad average annual passenger traffic growth of about 5.5 per cent a year. To meet these forecasts, all the "big three" jet airliner

term difficulties with traffic on some routes (such as this past summer's shortfall on the builders now have major new programmes under way, to meet different sectors of the market.

At the upper end of the scale, Boeing is now selling to airlines worldwide the latest version of its 747 Jumbo, the



Interior of the Fokker F-100 incorporates the most up-to-date ideas on cabin comfort

very long-range Series 400, of both aircraft down sufficiently under US anti-trust laws, col-such as reductions in fuel although it also continues to to enable it to compete fiercely laborate with Boeing, and there consumption of up to 40 per offer the stretched upper deck with Boeing and McDonnell are strong precedents for such cent compared with current Series 300 and the popular Series 200. Boeing now dominates the long-range airliner market, with nearly 730 747s of all types ordered, and more than 640 delivered.

Competition comes from the Douglas Aircraft Division of McDonnell Douglas, with its tri-jet DC-10, of which over 414 have been built and 429 ordered, but this group is now offering the world's airlines an advanced technology derivative called the MD-11, also a tri-jet. Douglas is now canvassing aunch customers, and hopes to he able formally to launch the MD-11 into production around the turn of this year.

Airbus is also now planning to enter the long-range airliner market, but with an aircraft of smaller capacity than either the Boeing 747 or the Douglas MD-11. Airbus believes there are many routes worldwide that need long-distance transport but do not have the traffic densities to justify the use of such big jets as 747s or MD-11s.

hig jets as 747s or MD-11s.

Accordingly, it is offering the airlines its new A-340 design, a plan for a 260-310 passenger four-engined Airbus that will be built alongside another new venture, the A-330, a twinengined, short-to-medium range aircraft, also seating about 260 to 310, according to configurations used.

By using a common fuselage and common wings and systems, Airbus believes that it can keep the overall development costs

Here, too, Airbus is looking for launch customers, and hopes to be able formally to launch both these new ventures around

the turn of this year. Earlier this summer, at the Hanover air show, there were suggestions that Airbus and Douglas might collaborate in

may be revived at the forth-coming Farnborough Air Show, and there is little doubt that collaboration of such a nature would benefit both companies.

This would ease their development costs, and widen their ultimate markets, and offer formidable competition to Boeing. The latter has plans of its own for a "long/thin" route aircraft—a new derivative of the 747, called the ADV or Advanced Development Variant, capable of firing m to 7000 for smaller proporan airliners. capable of flying up to 7,000 nautical miles with about 300

passengers While Airbus and McDonnell Douglas are still prepared to go it alone on their respective ventures, it clearly would make economic sense for them to col-laborate and thus avoid splitting the market three ways for

international collaboration-Boeing itself has a 25 per cent equity stake from the Japanese aerospace industry in its new 7J7 prop-fan transport, and actively seeks overseas partners

1990s is the new Boeing 7J7 twin-engined 150-seat prop-fan

Messerschmitt - Bolkow - Blohm and Dornier of West Germany, that could revolutionise the large market for commuter and regional transports currently dominated by conventional turbo-propeller airliners.

Just how far this prop-fan these long-range, lower-density revolution will eventually go aircraft, to the detriment of all.

McDonnell Douglas cannot, claims now being made for it revolution will eventually go

generation turbo-fan engines, lower noise, and less pollution —are proved, it seems clear that the jet engine will have a serious rival through the 1990s and into the next century.

on all its other craft programmes.

Below the long-range market for both high-density and low-to density traffic, the entire of market is a ferment of activity.

Airbus is pressing ahead airtiners as the Boeing 747, 757, 767 and 737, Douglas seater twin-engined aircraft, which is competing directly which is competing directly airbus A-320 and forthcoming A-330 and A-340, are not likely to be thrown overboard.

While all the major jet builders will be bount to be thrown overboard.

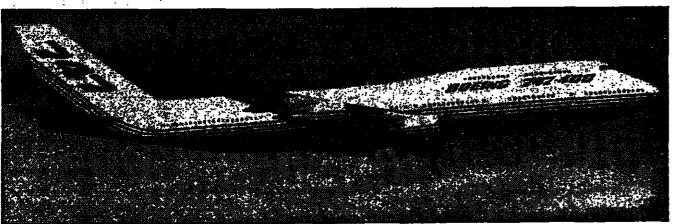
while all the major let airliner builders will be bound to explore the possibilities of the prop-fans, and at some stage in the future may even offer variants of their existing that aircraft with prop-far jet aircraft with prop-fan engines, the jet airliners now under development today will remain in service for as much as 20 years or more.

What cannot be overlooked ing 100 to 110 passengers.

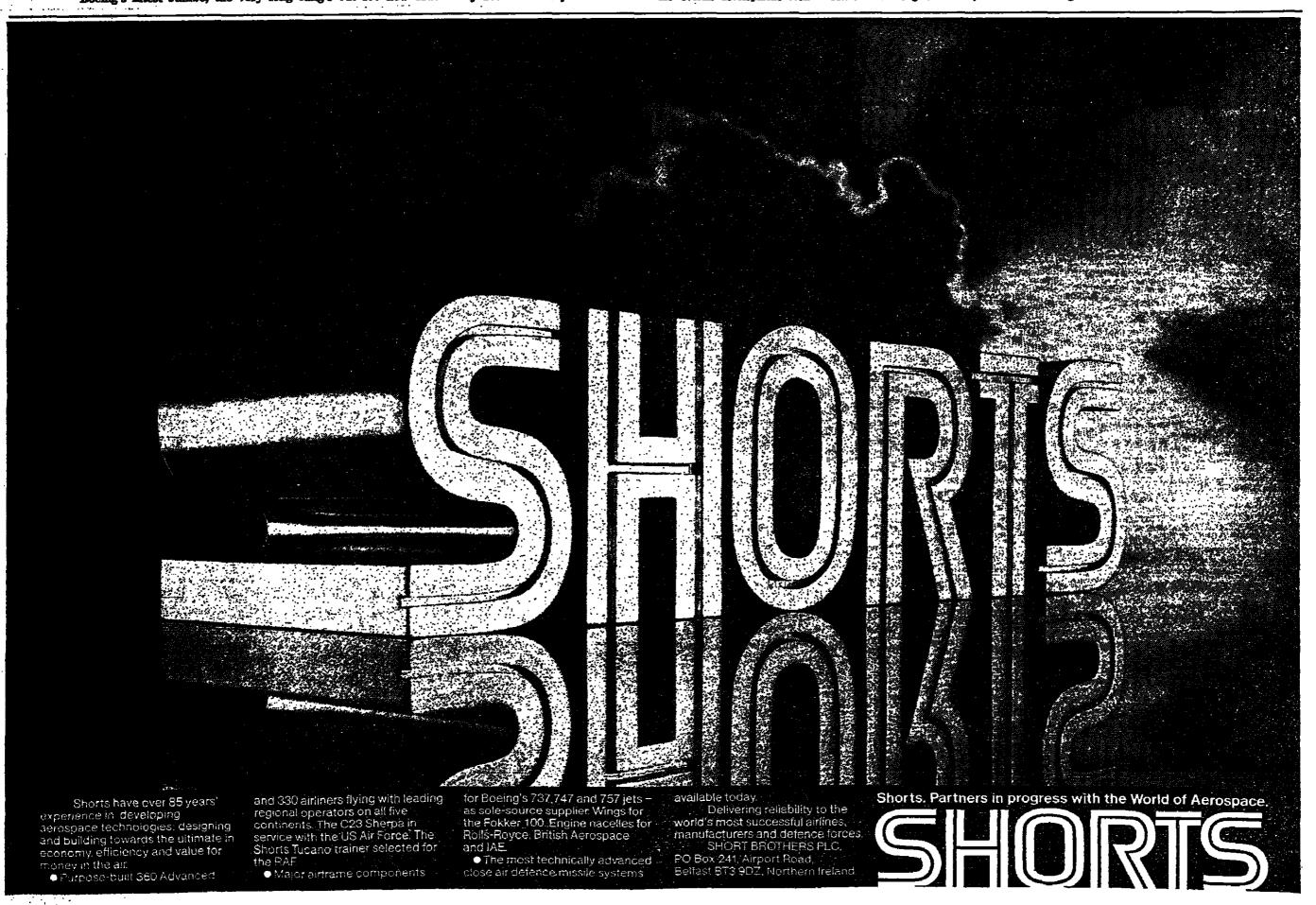
Below these, there are ideas ments are also being made in prop-fan airliners from such manufacturers as ments are also being made in prop-fan developments, and engine builders as well as the airframe manufacturers will be seeking returns on those out-

The pressures on airlines to convert to prop-fans will be immense, and the rivalry between the two types of propulsion will be formidable

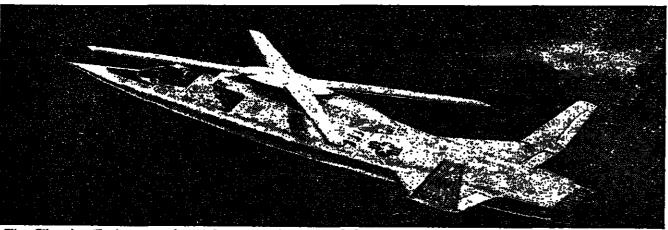
Michael Donne



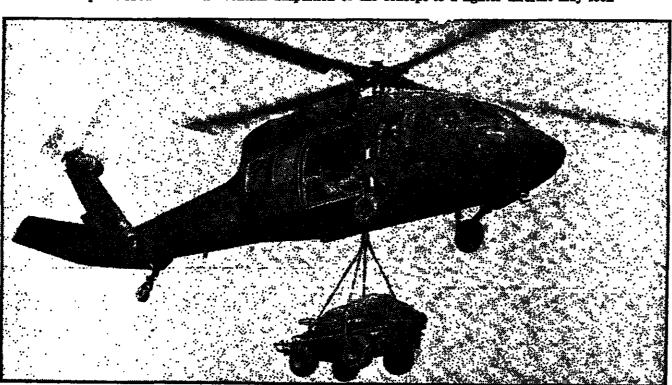
Boeing's latest Jumbo, the very long range 747-400 now ordered by British Airways

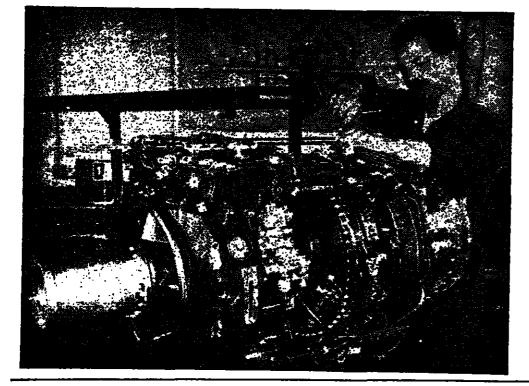


The Westland Lynx 3 helicopter set a new world helicopter speed record of 249.10 mph earlier this month, beating the previous record of 228 mph held by the Soviet Union



The Sikorsky X-wing experimental rotor-craft was rolled out earlier this month in the US. The artist's conception shows how an eventual adaptation of the concept to a fighter aircraft may look





AIR DATA COMPUTERS

COMBAT RADARS

ASW MISSION SYSTEMS

AUTOMATIC FLIGHT CONTROL

Above: the US Army Sikorsky UH-60 Black Hawk. This versatile helicopter, made in a number of versions including transport, combat, and search and rescue, could be ordered by the UK as an Army tactical transport and support aircraft. This prospect is

increased by this year's acquisition by United Technologies (Sikorsky) of a financial stake in Westland.

Left: Rolls-Royce and Turbomeca of France have jointly developed a major new helicopter engine, the RTM-322, which could be used in a wide range of rotorcraft in the years ahead. Its "core" could also be adapted for other types of engine.

HEAD UP DISPLAYS

HELICOPTER AVIONICS

NAVIGATION SYSTEMS

COMMUNICATION SYSTEMS

Costs cut through collaboration

DESPITE difficulties in world markets stemming from a short-term decline in civilian orders, especially from offshore oil customers, and a hiatus in military buying while major new pro-grammes are established, parti-cularly in the US, the long-term prospects for helicopters remain bright,

The exceptional versatility of this type of aircraft guarantees that between now and the end of the century it will remain in demand. However, the high costs of development and manufacture are already ensuring that the major new programmes now evolving are essentially col-laborative, both on an inter-company basis (as in the US) and on a wider international basis (especially in evidence in Westernational) Western Europe).

This collaboration is designed to damp down to some extent the over-capacity problems that have bedevilled the helicopter industry in recent years, giving rise to fierce competition for

Even so, it seems likely that the battles for world markets will be undiminished in ferocity, will be undiminished in ferocity, and all eight major manufacturers — Bell, Boeing-Vertol, Sikorsky and McDonnell Douglas in the US, Westland in the UK, Agusta in Italy, Aerospatiale in France and Messerschmitt-Bolkow-Blohm in West Germany—will be operating from now on in a much tougher environment.

So far as Westland is concerned, following the financial reconstruction earlier this year when Sikorsky of the US and Fiat of Italy acquired financial stakes in the company, the task is now to rebuild its industrial

Mr Hugh Stewart, group chief executive of Westland, points out that although United Technologies of the US (parent of Sikorsky) holds about 21.4 per cent of the nominal value of Westland shares and Flat holds about 18.5 per cent, in terms of woting shares UTC holds about 9.5 per cent and Flat about 5.3 9.5 per cent and Fiat about 5.3

"Thus, in terms of control, the combined UTC/Flat holding is now approximately 14.8 per cent," Mr Stewart says.

Currently, the Westland business environment is combusiness environment is com-plicated by three factors: the aftermath of the financial reconstruction; the effects of reductions in home defence spending by the Ministry of Defence; and current over-capacity in world helicopter manufacturing resources.

WS-70 by Westland, is now part has already flown, but it is not of the Westland's product line. This has the potential for manufacturing work to be carried out in the UK for Sikorsky, the manufacture in whole or in part of aircraft sold by Westland to UK or overseas customers, using the Rolla Royce/Turbomeca RTM-322 engine.

RTM-322 engine. An important customer, not yet committed for the WS-70 remains the Ministry of Defence.

Defence as continuing to be a major customer, accounting for 60 to 70 per cent of all helicopter sales by the company. substantially

supported.

Nevertheless, Westland
believes that it has some out
standing aircraft to offer—the new RTM-322 engine; and the Super Lynx, an outstanding

The Sea King itself, one of

Westland's mainstays in recent years, is also still an active programme with aircraft cur-rently being supplied to India for anti-submarine warfare The company's biggest venture for the immediate future,

however, is the EH-101, deve-loped under the international agreement with Agusta of Italy through the jointly-owned EH Industries. The first EH-101 will be rolled out in December, will be rolled out in December, with a first flight next spring. Nine flying prototypes are to be built, and eventually some 800 aircraft are envisaged. Costs could be as high as £650m for joint development, and £850m for UK production alone. The EH-101 — designed for all-weather day and night operations in a wide range of antisubmarine, anti-surface ship, search and rescue, replenishment, airborne early warning

ment, airborne early warning and electronic counter-measures and electronic counter-measures roles — has long endurance and can operate from both land and ship-borne bases.

The civil market is regarded as especially important for the EH-101, primarily with opera-

cipate in plans for the interna-tional development of a multi-national European multi-role national European muti-role helicopter, the NH-90, for the 1990s, if that venture matures. So far, it is only in the feasi-bility study stages, between the UK, France, West Germany, Italy and Holland, and no decisions to go further into project definition have yet been taken. But it could yet prove to be a

major project for the 1990s. Also, Westland is involved with Agusta of Italy on the plan to develop a new Light Attack Helicopter (LAH), from the current Agusta A-129 Mangusta helicopter, probably with the participation also of Holland and

But it could yet prove to be a

The fact is that, despite the financial and political difficulties of the latter part of 1985 and early into 1986, Westland has survived as a manufactur ing entity in the world helicopter industry. Its present management intends that it will stay in that league.
It is justified in that view in

its estimates of future world helicopter markets. Despite difficulties in the past few

light naval helicopter for land sees no reason why it fierce procurement battles ever general-purpose duties. The Boeing Vertol/Sikorsky International, Singer, TRW Military Electronics Division, Hamilton Standard and Westing. house Defence and Electronics The Bell/McDonnell Dongla Hughes Alteraft, Sperry Corporation, Texas, Instruments and others.

On each side the line-up is formidable, across the entire spectrum of aerospaca tach nological disciplines.

Current plans envisage a decision on full-scale development by the US Army during 1987, with first dight of the winning helicopter in 1991. If Sikorsky and Boeing Vertol win the contract, there is ever prospect of some LHX work coming to Westland in the UK. The Rolls Royce/Turbomeca RTM-322 engine already mea-tioned represents a major hid to win massive engine markets in

nelicopters both at bome and Flight trials of this engine (which could also be adapted to other uses) began earlier this summer in a Sikorsky S-70C air-craft, the civil variant of the US

Potential applications for the RTM-322 include both the US Black Hawk and Sea Hawk h copters now in service with the US armed forces, the Angla-Italian EH-101, the Westland 30, the prospective European NH-90 Nato helicopter for tartical transport and other duries, and a single-engined version of the Italian Agusta A-129 for antiseen as bright. Although civil tank and other roles.

The RTM-322 programme is funded by Rolls-Royce and Turbomeca, with support from both the UK and French Govern-

The RTM-322 engine in also possible candidate for re-engin-ing the McDonnell Douglas AH-64 Apacha helicopter, now used extensively by the US Army. This engine # its Army. This engine #fits beautifully into the AE-64, according to McDonnell Douglas its power from 1,709 shp to 2,000 shp.

Among other major he developments that could transform the future of rotary wings flight is the recent US Naval Air Systems Command decision to place a \$1.7bn seven-year contract to the joint Boeing Vermi-Bell Helicopter Textron team for the development of the V-22

the LHX (Light neuron to forward flight, reaching to about 5,000 of these aircraft of more than 300 mph and altitudes close to 30,000 feet. It is to be ordered through today for both military the LHX (Light Helicopter prop sircraft in conventional are likely to be ordered through the rest of this century, making it the most lucrative helicopter transport and for civilian applitransport and for civilian appli-

Initially, the development programme calls for the first flight of the V-22 by June, 1988, with production deliveries beginning in December, 1991, to the lead service, the US Marine

Current plans call for the eventual production of 1,213 Ospreys for the US Marine Corps, Navy, Army and Air Force, for wide-ranging roles including combat assault, support, search and rescue, an marine warfare and special support operations.

Future commercial versions of the Osprey could efficiently support long-range off-shore oil exploration activities and permit fast, effective city centre to city centre operations, by-pass-ing congested airports and stal ground traffic delays. Such arribre-style versions of the Cosprey could be available by the mid-1990s.

US aviation analysts have estimated that the world market for commercial tilt-rotor aircraft now ranges from \$,000 to 10,000 aircraft up to the end of this century. of this century.

Michael Donne

by the eight leading makers is undiminished in ferocity

The battle for world markets

tions in the offshore oil indus-try in mind, in such areas as the North Sea, the Canadian Arctic North Sea, the Canadian Arctic and South America and Antarctica. But it is believed that opportunities will also develop in the civil commuter market and elsewhere, so that eventually between 300 and 400 civil EH-101s will be built, or almost half the total market for the half the total market for the aircraft.

A possible further variant is the Utility model, for tactical use by land forces, which could generate a market for 250 or more aircraft. Westland says that with the EH-101 it is mak-ing a vigorous bid for civil helicopter markets worldwide.

Another possible Westland civil venture is the W-30/300, a version of the original W-30 transport helicopter, of which in turn other versions are in pro-duction for the Helicopter Corporation of India and in sermanufacturing resources,
The main consequence of the reconstruction is that the US Sikorsky Black Hawk, called the Robert Maxwell). The W-30/300

> Mr Hugh Stewart comments that " if we find a customer who wants the Westland W-30/300, and the order is hig enough to justify launching the aircraft, we will launch it and that does not in any way conflict with the

culatively.

Black Hawk. Westland sees the Ministry of

Over-capacity in helicopter manufacturing continues to be a problem. In the US, the major manufacturers are in a stronger position, substantially supported by large-scale military orders, which helps to reduce costs through large production. costs through large production runs. On the Continent, the major manufacturers are also

standing aircraft to offer—the EH-101 Sea King replacement, with a civil variant also planned; the WS-70 derived from the Sikorsky Black Hawk, which is effectively a new high performance tactical helicopter, especially when fitted with the new BTW-322 environment and the

they will match, if not exceed military markets. For the immediate future, the latter are the more promising.

markets are still alow to

develop, eventually it is believed

Westiand sees overall markets (outside the US and also the Soviet Union and other Eastern bloc countries) amounting to more than £200n for military helicopters of all kinds, coverover 9,000 aircraft, up end of this century.

These include up to 1,300 naval helicopters worth about £5bn in the Lynz/Sea King/EH-101 category; 3,190 aircraft worth £10bn in the army support category; some 2,000 aircraft worth £4bn in the Army attack helicopter class; and about 2,500 worth £1,5bn in the light military class Many of these fields are likely to be dominated by Osprey tilt-rotor aircraft. exports of US helicopter types, however, especially if such major new US programmes as the off and land like a helicopter but also to fig like a turbo-

programme anywhere in the cations.

Western world.

Initial Two major groups are bidding for the contract—Boeing Vertol and Sikorsky Division of United Technologies, against Bell Helicopter Textron and McDonnell Douglas Helicopters.

"The Westland 30 is the less expensive end of the market and the Black Hawk is at the m Many other major equipment, expensive end, so I don't think there is any real conflict becomponent and ancillary sup-pliers in the US aerospace industry are lining up behind one or another of these two teams, and the final competitween the two aircraft. If we look as though we can do good business, we will make them."

Looking further ahead, Westtilon will be one of the most

World market for helicopters (1987-96)

	~	Weight class ———————————————————————————————————												
Sector	Light	mediate	Medium	Heavy	Total									
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Source: Sikorsky Aircraft	-	•	1	7000	421-6									

THERMAL IMAGERS

NIGHT VISION SYSTEMS

 TERRAIN REFERENCED AVIONICS UNMANNED AIRCRAFT SYSTEMS

MORE THAN 50 TYPES OF AIRCRAFT ARE NOW UPDATING WITH OUR AVIONICS SYSTEMS

BRITAIN'S PROVEN PERFORM

BY FAR THE UK'S BIGGEST EXPORTER OF ELECTRONIC SYSTEMS FOR AIRCRAFT

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New shapes

Planning for the Mach 5 airliner

WITH CONCORDE now well into its eleventh year of regular scheduled supersonic air services, and likely to last until the end of this century and well into the next, there have been few suggestions for the development of a possible

direct successor.

Although from time to time designs of potential "Mark Two" Concordes have emerged -the most recent being a design study earlier this year by Aerospatiale of France, one of the original Concorde manufacturing partners — the potentially high costs involved coupled with the limited market, have deterred governments, aerospace manufacturers and air-lines alike from committing themselves to such a develop-

Now, it seems likely that the trend of research into very high-speed aircraft on both sides of the Atlantic could accelerate, to the point where a big leap forward is made. This would by-pass any second-generation supersonic airliner, and move instead directly to a new type of even faster "hypersonic" aircraft—that is, capable of flying at more than five times ed of sound (Mach 5, or nearly 3,400 mph), against Con-corde's twice the speed of sound (Mach 2, or about 1,200 mph).
Such aircraft would fly so
high (well over 100,000 feet)
that they would be close to the fringes of the Earth's atmosphere. From such hypersonic transports, it would not be difficult to develop aircraft that would have the capability of entering low-Earth orbit on ballistic style trajectories to give them even faster journey

From that in turn it would

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be used as transports but also as workhorses in orbit, for surveillance or even satellite launching, while still using runways for taking off and landing
like conventional aircraft.
Current research is involved
with both forms of vehicle
—hypersonic and trans-

atmospheric.

for a long time was widely spread, covering not only hypersonic transport ideas but also transatmospheric vehicles, it has now been officially focused on hypersonic transports on hypersonic transports through the National Aerospace Plane (NASP) concept.

This, however, could even-tually devolve into a family of vehicles, including a true trans-atmospheric vehicle for reduc-ing the costs of putting space-craft payloads into low-Earth orbit by the end of this century at cheaper rates than the cur-rent Space Shuttle can provide. As the US Defence Department has stated: "If the new research programme is succe ful in demonstrating the necessary technologies, an entirely new family of aerospace vehicles will be possible, able to cruise within the upper atmosphere at hypersonic speeds, or ascend directly into

atmospheric.

In the UK it is concentrated on the "Hotol"—for Horizontal Take-Off and Landing—a true transatmospheric vehicle, designed to use runways like an aircraft but also to soar into orbit like a spacecraft.

In the US, although research for a long time was widely preform various missions in space, such as satellite launching to Earth to land like a conventional aircraft to Landing—a true transatmospheric vehicle, designed to use runways like an aircraft but also to soar into be unmanned, the current studies also include the possibilities of a manned variant, with a pressurised cabin replacing the cargo bay.

The US space Shuttle, for its eventual landing back at its base, or at some other specially-designated runway. In its unmanned configuration, the form the use of the US space Shuttle, for its eventual landing back at its base, or at some other specially-designated runway. In its unmanned configuration, with a pressurised cabin replacing the cargo bay. The Hotol would be fuelled

for flight in space by liquid hydrogen and liquid oxygen, although air-breathing engines would also be used for its con-ventional take-off and landing ventional take-on and landing roles. Because the Hotol is currently the subject of Govern-ment-funded "proof-of-concept" studies, details of its design and its power-plants are not vealed, although the latter are claimed to be far in advance of

anything yet attempted.
It is suggested that Hotol would have a take-off speed of about 290 knots after a runway roll of about 7,500 ft. The vehicle would be flying supersonically after two minutes, with an angle of climb of about 24 degrees.

It would be clear of commercial air traffic after 4.5 mins (40,000 ft height), and would reach a speed of five times that of sound (Mach 5)

effectively would be "aerospace" very large reductions in the it could coast up to an planes" or "transatmospheric cost of placing payloads in operating height of about 300 vehicles," that could not only orbit."

as with the Space Shuttle. It is claimed that Hotol will reduce the costs of putting payloads into low Earth orbit by a factor of five, and could as much as halve the costs of putting payloads into higher arbits. orbits, such as those that geosynchronous satellites (for

example, telecommunications satellites) normally use. This economy of operation, coupled with quick reaction and a rapid turnround capability, will enable Hotol to compete realistically for about 75 per cent of the commercial market for launch capability from the

year 2000 onwards.

Moreover, it is also claimed that because the Hotol technology is forward-looking, with ample potential for develop-ment beyond the cheap and effective spacecraft launcher which is envisaged at present, it could be eventually developed "As a space launch vehicle operating from conventional runways, the fully reusable and single state aspects of the NASP are believed to produce after nine minutes flight. At a into a commercial transport, height of about 90 km, it would capable of passenger flights reach orbital velocity, and single state aspects of the NASP are believed to produce would be switched off so that At this stage, the progress

very large reductions in the cost of placing payloads in orbit."

The UK's Hotol venture, now the subject of a £3m study by British Aerospace and Rolls-Royce funded by the Department of Trade and Industry, is a subular-looking design for a spacecraft that could take off from normal runways, boost itself into near-earth orbit to perform various missions in space, such as satellite launch—for its eventual landing back

it could coast up to an operating height of about 300 "proof of concept" studies is not revealed. But at the end of the first six months of these studies, costing an estimated \$750,000 shared by the Government through the British National Space Committee and (OMS) would slow the Hotol down, to enable it to return to Earth at a speed slower than that of the US Space Shuttle, for its eventual landing back be continued.

If the Government is con-

vinced that Hotol has a prac-ticable future, and would not be unduly expensive, further development studies would probably be authorised. Eventually, however, it seems likely that international collaborathat international collabora-tion on the venture will be sought, primarily in Western Europe where there is already considerable interest in it. In West Germany, studies into possible future hypersonic flight research vehicles have also been initiated, with a view to determining whether these

schmitt - Bulkow - Blohm and ERNO, called Horus (a manned out pilotless Hypersonic Orbital involved. Research and Utilisation System), which would be larger than Hermes. Both Hermes and Horus are in-tended for launch aboard the advanced European Arlane 5 advanced European Arlane 5 ing supersonic combustion launcher rocket, but both would ram-jet engines, capable of land back at base like aircraft.

Whether Harmes and Howe

Whether Hermes and Horus are overtaken by Hotol, or all these ideas come together into one transatmospheric vehicle or "aerospace plane" remains to be seen. But what is clear is that not all of these ideas can be financed in Western Europe, and that the UK could never go ahead with Hotol alone. At some stage in the near future, a major debate on which ven-ture goes ahead in Western Europe, and with whom, must

occir.
In the US, work has begun
on the X-31 National Aerospace Plane (NASP); a project for a hypersonic (over
Mach 5, or nearly 3,400 mph) vehicle for service around the end of this century, that would be capable of both military and commerical operations.

In the initial phase, the

In the initial phase, the They will study configuration One Department of Defence and the designs, and the technology rewhich e National Aeronautics and Space quired to develop them. At a Senate

A McDonnell Douglas concept of an "Aerospace Plane" which would be capable of flying at five times the speed of sound, or nearly 3,400 mph, by the year 2000, if current US ambitions are fulfilled

also been initiated, with a view to determining whether these provide alternatives to the development of the Frenchinspired Hermes manned reusable spacecraft, planned for launch in 1995, which is similar to but smaller than the US Space Shuttle's Orbiter spacecraft.

One such study is by Messerschmitt - Bulkow - Blohm and ERNO, called Horus (a manned for large provide and NASA, at Wright-Patterson Air Force Base, Ohio, to manage the programme, in which the US Strategic Defence large provide alternatives to the technology validation."

A joint office has been established by the Defence Advanced Research Projects Agency (DARPA), in conjunction with the US Air Force and US Navy and NASA, at Wright-Patterson Air Force Base, Ohio, to manage the programme, in which the US Strategic Defence Initiative Organisation is also

General Electric and Pratt and Whitney, the two main US aero-engine companies, have received contracts worth about \$175m each to study air-breathwhich at very high speeds while at sub-orbital heights, where air-breathing engines can still function. Aerojet Tech-Systems will be associated with General Electric in the venture.

Other forms of propulsion, using liquid oxygen and liquid hydrogen, for example, will also be studied for possible eventual use in an orbital flight vehicle, although much work has already been done in this field over many years in the existing US space programme, especially in the development of the Space Shuttle.

Airframe companies gaining contracts worth about \$32m each are Boeing, General Dyna-mics, Lockheed, McDonnell Douglas and Rockwell Interna-

bodying the technological know-ledge gained in the current phase into an experimental flight-test vehicle, by about 1993, before any final develop-

ment of a full-scale hypersonic
"aerospace plane" begins.
The NASP programme is thus
still only in its very earliest exploratory stages, with no clear-cut conclusions as to how any vehicle will eventually look, or precisely what tasks it will eventually perform, or how. That is what the 42 months' technology validation phase now starting intends to clarify. Mr Robert C. Duncan, director of the DARPA told a US Congressional sub-committee on

aviation earlier this summer that the NASP programme was aimed at producing a vehicle that had a "highly integrated engine and aircraft structure," a high-temperature metallic structure designed for many flights, a large, highly-streamlined fuselage with integral fuel tanks, and multiple engines and exhaust nozzles.

Until the manufacturers produce their various designs of the projected NASP, few other details of its size or capabilities are likely to emerge. But some of the manufacturers have already given their own individual ideas. already

One is McDonnell Douglas, which earlier this year told the

Administration have awarded seven contracts to US aerospace be reduced in number through and engine companies, worth about \$500m over a 42-month seven contracts to US aerospace be reduced in number through that the NASP programme could result in a transport air-about \$500m over a 42-month seven contracts to US aerospace be reduced in number through that the NASP programme could result in a transport air-about \$500m over a 42-month seven contracts to US aerospace be reduced in number through that the NASP programme could result in a transport air-about \$500m over a 42-month seven contracts to US aerospace be reduced in number through that the NASP programme could result in a transport air-about \$500m over a 42-month seven contracts to US aerospace be reduced in number through that the NASP programme could result in a transport air-about \$500m over a 42-month seven contracts to US aerospace be reduced in number through that the NASP programme could result in a transport air-about \$500m over a 42-month seven contracts to US aerospace be reduced in number through that the NASP programme could result in a transport air-about \$500m over a 42-month seven contracts to US aerospace be reduced in number through that the NASP programme contracts to US aerospace be reduced in number through the programme contracts to US aerospace be reduced in number through the programme contracts to US aerospace be reduced in number through the programme contracts to US aerospace be reduced in number through the programme contracts to US aerospace be reduced in number through the programme contracts to US aerospace be reduced in number through the programme contracts to US aerospace be reduced in number through the programme contracts to US aerospace be reduced in number through the programme contracts to US aerospace be reduced in number through the programme contracts to US aerospace be reduced in number through the programme contracts to US aerospace be reduced to US aerospace be reduced to US aerospace be reduced to US aerospace be r tractors for the next phase of the programme.

The latter, probably starting about 1990, will involve embodying the technological bases.

president of engineering for the Douglas Aircraft Division, said such a transport, burning methane fuel and using conven-tional runways for take-off and landing, could carry up to 305 passengers over distances of 6,500 nautical miles, cruising at more than 3,000 mph at heights of over 100,000 feet and bring-

or over 100,000 feet and bringing Sydney to within two and
a half hours of Los Angeles, or
Washington within two and a
half hours of Tokyo.
Such vehicles could also
eventually be used for work in
space, delivering payloads such
as estallities at much lower as satellites at much lower costs than the existing manned Space Shuttle transport system.

It has been repeatedly stressed in the US that the NASP programme is the key to regaining the substantial lead in aerospace once enjoyed by the US" — a reference to US concern at the way in which Western Europe has developed its aerospace potential in recent

It is also a reference to the concern now felt in the US at the way in which the Soviet Union has developed a substan-tial space industry, and is now in a position to build up a commanding lead in manned spaceflight following the recent problems with the US Space Shuttle.

Michael Donne



The British Aerospace/Rolls-Royce Horizontal Take-Off and Landing (Hotol) design for a transatmospheric vehicle is now being studied under a joint financing venture with the Department of Trade and Industry



It won't be hard to find the most advanced jetliner at Farnborough.

Big budget projects beat the curbs

budgets on both sides of the often be developed through off-Atlantic will be dominated by set deals on military aircraft some multi-billion dollar pro- purchases. grammes for combat aircraft, strategic bombers and transports, some of which have already begun.

areas as materials, production methods, design techniques and even new ways of flying, that will have a major spin-off in commercial aircraft manufacture, and give the aerospace industry as a whole a major new impetus as it moves towards the 21st century.

At the same time, the expan-Third World air forces is proceeding apace, and will account for a continuing substantial share of the estimated military spending over the next decade and a half.

This growth is being accompanied by an expansion of inte-

amount to more than \$500bn. aerospace enhances any nation's Despite pressures on defence spending in some countries, the cause such industries can now

is focused on the new gene-ration of combat aircraft now Collectively these will spear-head new advanced techno-logical developments in such areas as materials, production and Spanish industries, and its rival, the French Dassaulf-Breguet Rafale, in which Holland, Belgium and Norway may also participate

The French Rafale "tech-nology demonstrator" has sion and re-equipment of many Third World air forces is pro-

and is due to be completed in September. The four nations involved will then submit the project for government approval, In Western Eurpoe, attention and full go-ahead.

The Eurofighter design is for a single-seat, twin-engined, delta-winged aircraft with a small canard fore-wing, for the air-to-air combat role but also capable of fulfilling air defence and air-to-surface (ground attack) roles.

The planned programme comprises about 800 aircraft for the air forces of the four nations The French Rafale "technology demonstrator" has already made its maiden flight. The UK's Experimental Aircraft Programme (EAP), delayed for some weeks weeks because of labour problems at West Germany, 21 per cent for British Aerospace's Warton the UK and the UK an

> cluding the avionics.
>
> It seems likely that consortia of companies will be encouraged to undertake specific equipment items, as has been the case with the existing Tor-

SENER of Spain.

ing director of the engine com-

Eight prototypes will be built to flight test the entire Euro-fighter weapons system and it is

intended that production air-craft should go into service in

In technical terms, the air-

craft will have a basic mass empty weight of 9.75 tonnes, and a wing area of 50 square metres, with each engine de-livering about 20,000 lbs thrust.

The Air Staffs of the four

countries have agreed on the equipment to be used in the air-craft and once formal full go-

pected that a vast number of equipment and component sup-pliers in the four countries will

be invited to submit competitive tenders for that equipment, in-

provide employment for many thousands of workers throughout the West European sero-space industry, for many years to come, for it will remain in production through to the end of the century and beyond. If exports are taken into account, total production could go well beyond 1,000 aircraft—the Tornado is already close to that figure. The Eurofighter will come

into production in the early 1990s just as Tornado is running down, so that continuity of military aircraft quantity produc-

The cost of the total Euro- prime contractor and the others

THE WESTERN world's spending on new military aircraft continues to run at a high level, and between now and the end of industries as their own—parity this century is expected to amount to more than \$500m.

Despite pressures on defence rest in aerospace manufacturing available, these demonstrators will effectively prove in operation the advanced technologies of the more advanced technologies of the more advanced aircraft to the more advanced aircraft to the new 20,000 lbs thrust engine than \$500m.

Project definition of the Eurofighter is now well advanced,

Project definition of the Eurofighter is now well advanced,

Despite pressures on defence rest in aerospace manufacturing available, these demonstrators will effectively prove in operation that advanced technologies of the more advanced aircraft plant to follow.

CASA of Spain and Messer design, development and production has never been given but unofficial estimates have the new 20,000 lbs thrust engine that the new 20,000 lbs thrust engine that a twell over £10bn. The limital Experimental Aircraft programme, for research design, development and production has never been given but unofficial estimates have the new 20,000 lbs thrust engine that a well over £10bn. The limital Experimental Aircraft programme for research design, development and production has never been given but unofficial estimates have the new 20,000 lbs thrust engine that a well over £10bn. The limital Experimental Aircraft but and the new 20,000 lbs thrust engine that a well over £10bn. The limital Experimental Aircraft but and the new 20,000 lbs thrust engine that a well over £10bn. The limital Experimental Aircraft but and the new 20,000 lbs thrust engine that a well over £10bn. The limital Experimental Aircraft but and the new 20,000 lbs thrust engine that a well over £10bn. The limital Experiment and the new 20,000 lbs thrust engine that a well over £10bn. The limital Experiment and the new 20,000 lbs thrust engine that a well over £10bn. The limital Experiment and the new 20,000 lbs Royce, Flat Aviazione, Motorencost the UK industry and Turbinen - Union and Government jointly up to £180m to date, and further Mr Gerrie Willox of British EAP funding will be necessary Aerospace is managing director to cover the test programme of Eurofighter, and Mr Colin that will follow the maiden Green of Rolls-Royce is managflight over the years ahead.

So far as the Tornado itself is concerned, with another 124 is concerned, with another 124 recently ordered from Panavia, bringing total Tornado orders to 933, production of that aircraft is assured through to at least 1992. Without the additional orders, production was likely to end in about 1989. (The additional aircraft include those ordered by Saudi Ambients.) those ordered by Saudi Arabia and Oman, and 34 aircraft for the Luftwaffe for electronic/ combat reconnaissance (ECR)). The new aircraft will be produced at a rate of 4.5 aircraft per month, instead of the current nine aircraft a month, to

ensure continuity of production into the 1990s. In the meantime additional orders for the Tornado are being sought widely, with possible procurement by Turkey and Jordan now under discussion.

In the US, three major military aircraft manufacturers, Boeing, General Dynamics and Lockheed, have joined forces in a bid to win a \$26bn order technology demonstrators" for both aircraft have now flown the Experimental Aircraft Programme (EAP) in the UK having been delayed for some weeks through industrial problems at British Aerospace's Warton factory.

The Eurofighter were in a bid to win a \$26bm order for the US Air Force's proposed Advanced Tactical Fighter (ATF). Designed to succeed the existing F-15 fighters built by McDonnell to one of the biggest orders.

The US Air Force is look-ing for upwards of 750 aircraft initially at an initial fly-away price of about \$35m per air-

The US Air Force plans to award competitive contracts this October for the demonstraing (ASTOVL) aircraft by the mid-1990s. tion and validation phase. All the companies involved in mili-tary aircraft activity in the US are expected to bid with inde-pendent submissions, but the Boeing, General Dynamics and Lockheed team have agreed that whichever of the three wins, all will work on that contract, with the winner as



A Lockheed-California Company artist's conception of how the future US Air Force's Advanced Tactical Fighter (ATF) might look

sub-contractors. McDonnell power-plant concepts for such Douglas and Northrop have joined forces in a similar group to fight for the ATF.

McDonnell power-plant concepts for such an aircraft. The next logical step following this research programme could be an experi-

to fight for the ATF.

The US Air Force is also studying a new advanced tactical bomber (ATB) programme, that could cost as much as \$50bn eventually. Primarily designed by Northrop, this aircraft is intended to become operational in the early 1990s, but there is still no found combut there is still no formal commitment to the venture by the An Advanced Tactical Air-

craft (ATA) for the US Navy is also currently under study. which would also be a multi-billion dollar programme. The UK and the US are also now involved in a joint study of a wide range of airframe and engine technologies that could lead to an advanced supersonic short take-off and vertical land-

A memorandum of under-A memorandum of under-standing between the two countries for this purpose was signed earlier this year, and the broad objective is to define the technologies that such an aircraft might require. It is not yet a formal programme to develop a new jump-jet fighter to replace the existing Harrier, although it could eventually although it could eventually lead to such a joint programme. Much of the work under the MoU is devoted to exploring new

mental aircraft development venture, jointly funded to test the concepts in flight, but this is not immediately in prospect.

A new generation of transport aircraft is also now kooming large in US military thinking. McDonnell Douglas has a \$3.4m USAF contract for full-scale development of the USAF's new C-17 long-range four-engined airlifter, of which eventually 210 will be built.

Assembly of the test aircraft will begin in 1987, and assembly

will begin in 1987, and assembly of the first production alreraft in 1988. Entry into services will be in 1992, and completion of the order is set for 1999.

European Programme Group (IEPG) of Nato has been studying for some time the possibility of developing on an international collaborative basis a new large transport alreraft (the Future Large Aircraft or FLA) that could basically fulfil the testical transport pulse between tactical transport role but also be suitable for adaptation to other duties, such as maritime

-could emerge-between now and

This FLA study is independent of an industrially-based study called FIMA (Future International Military/Civil Airlifter) in which Aerospatiale, British Aerospace, Lockhead British Aerospace, Lockheed and Messerschmitt-Bolkow-Blohm have been involved. McDonnel Douglas of the US
also has a study for an Advanced
International Military Short
Take-Off and Landing Airlifter (AIMSA).

Whether all these ideas can at some stage be brought together in one coherent inter-national Nato programme remains to be seen.

What is clear is that not all of them will ultimately be developed—the demand is not sufficiently great, and the costs Where transport aircraft are would be prohibitive. The most concerned, the Independent sensible objective would be for the FLA and the FIMA projects to be brought together, under NATO suspices.

If an in-service date of about

the year 2000 is postulated, full development would need to be established by 1994, which indicates that firm commitments would need to be taken between then and 1990, which in turn indicates an increasing level of patrol and anti-submarine warfare, airborne early warning,
and as an aerial tanker.

A European market for
several hundred such aircraft

could engage between your and

Michael Donne

Missiles

Pace of change brings problems

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:nce 'OW'(manufacturers and the future of some recent projects has Congress as too expensive and seen in the balance.

Artificial intelligence is becoming a prime target for acrospace companies development.

Earlier this year, Mr David packard, the chairman of the drawing boards of several missile manufacturing companies loclude missiles to recognise and attack targets "goldplated weapon, built with the price based on a purchase of 17,200 missiles for the USAF and just over 7,000 missiles for the USAF and just over 7,000 missiles for the US Navy.

AMRAAM may eventually be produced in Europe by a partnership of British Aerospace and attack targets "goldplated weapon, built with the Rolemann The launch aircraft or ground

alone after launch, but the high would seek to increase off the cost of their development has shelf purchasing and stop the led to a parallel move by cost-conscious defence departments superfluous technology, the towards smaller, simpler and commission recommended. faster hittile weapons. These

make direct hits on targets. The AMRAAM, advanced launched from a manoeuvring medium range air-to-air missile, aircraft.

The Grumman E-2C Hawkeye Airborne Early Warning and Control (AWACS) aircraft, for detecting and locating hostile aircraft, in service with the US Navy,

has been offered to the UK as an alternative to the Nimrod project. Another Grumman proposal is to fit the Hawkeye's radar and other avionics systems to

the Nimrod airframe—the Hawkrod

The commission called for battery.

Advances in electronics, with smaller, higher-speed semiconductor circuits and more Systems Acquisition Review The US Government has a constant of the constant of t

recognise and attack targets "goldplated weapon, built with and Messerschmidt-Bolkow-autonomously, operating comtoo many capabilities at too
pletely independently of the high a cost."

Messerschmidt-BolkowBlohm in West Germany. The
UK and Germany are already UK and Germany are already working on the advanced short range air-to-air missile, ASRAAM, which may be com-

ductor circuits and more Systems Acquisition Review The US Government has coningenious computer software, Council to a more powerful sidered requests from the partant missiles. The missiles operate Management Board. This board missile. The European commissiles. The missiles operate Management Board. This board missile. The European commissiles believe The US Government has considered requests from the partant missiles. In Europe, missiles missiles. The European commissiles and more software, council to a more powerful sidered requests from the partant missiles. The European commissiles and more software, council to a more powerful sidered requests from the partant missiles. The European commissiles and more software, council to a more powerful sidered requests from the partant missiles. The European commissiles and more software, council to a more powerful sidered requests from the partant missiles. The European commissiles are software, council to a more powerful sidered requests from the partant missiles. The European commissiles are software, council to a more powerful sidered requests from the partant missiles. The European commissiles are software, council to a more powerful sidered requests from the partant missiles. The European commissiles are software, council to a more powerful sidered requests from the partant missiles. them to build the missiles for a has had difficulties with its airfixed price, as required by the UK and West German Govern-

In tests, the missile has hit a manoeuvring target after being launched from a manoeuvring jeopardised by the reluctance in aircraft.

European production under radiation from surveillance radiation

MISSILE development is recent years. It could become changing rapidly in response the West's main medium range to more complex demands by air-to-air weapon, but has been air-to-air weapon, but has been racked by problems.

The missile is to enter service with the US Navy and Air vice with the US Navy and development stage, such as AMRAAM. Phoenix contains the electronic equivalent of about 4m transistors. AMRAAM contains the equivalent of 7m transistors.

Other innovations include the possible use of coated optical fibres for the secure transmission of data to and from missiles, to make it impossible for an enemy to jam missile control systems. Guidance data for the missile could be transmitted down high-strength optical fibres instead of down the metal wire used at present on several

In Europe, missile manufac-turers have had their problems. British Aerospace, for example, launched anti-radiation missile, Alarm. Anti-radiation missiles are designed to home in on the

The Alarm missile is being developed in a £200m fixed-price Government contract, but it has problems with its new two-stage solld rocketmotor the Nuthatch. This has been developed by Royal Ordnance Explosives division, the Government-owned arms and munitions company, whose sale on the Stock Exchange was postponed earlier this summer.

The original contract for swolf, under a £130m contract version of Seawolf, under a £130m contract version of Seawolf, under a £130m contract of vertical-launch version of Seawolf, under a £130m contract of vertical-launch version of Seawolf, under a £130m contract of vertical-launch version of Seawolf, under a £130m contract of vertical-launch version of Seawolf, under a £130m contract of vertical-launch version of Seawolf, under a £130m contract of vertical-launch version of Seawolf, under a £130m contract of vertical-launch version of Seawolf, under a £130m contract of vertically so it can turn in any direction towards its target through 380 degrees.

This system is to be installed to the Royal Navy's new type 23 frigates and on the auxillary oiler/replenishment vessels.

British Aerospace received a \$440m contract from the Mod.

The original contract for rocket motor development was for kits to upgrade existing let by BAe to the former British Army Rapier surface-to-government-owned Propellant, Explosives and Rocket Motor Establishment PERME was subsequently taken over by Royal Ordnance, which is still owned by the Government after the abortive attempts to privatise the company with a stock. The advances in missile technology have not made gun and the company with a stock. The advances in missile tech-exchange flotation this summer, nology have not made gun and

cessful in its bid for a lucrative West German contract for antiradiation missiles. In May, west Germany ordered the Taxas Instruments' Harm high-speed anti-radiation missile, In the US, the Strategic De-

and from Short Brothers of Belfast for the Starstreak highvelocity missile.

At the British Army Equipment Exhibition in June, the Master-General of the Ordnance, Lt-Gen Sir Richard Vincent, said that the Shorts Starstreak missile on an Alvis Stormer vehicle had chosen to meet the Army's requirement for a high-velocity

anti-aircraft missile.

The MoD is considering fitting British Aerospace Seawolf short-range anti-missile missiles to the Royal Navy's three aircraft carriers and some Type 42 destroyers. The company's naval weapons division was awarded a £400,000 contract in the spring to study how Seawolf could be developed with a

lightweight launcher.
The company is already developing and test-firing its vertical-launch version of Sea-

this summer.

British Aerospace received a The original contract for \$440m contract from the MoD

The first of 750 Alarm missiles are supposed to be in service with the Royal Alar Force late next year.

British Aerospace was unsuccessful in its hid for a live state of the training of the abling the trajectory of gun shells to be corrected in flight.

West Germany has a require-fence Initiative Organisation is be deployed later this year, ment for up to 9,000 missiles. ment for up to 9,000 missiles.

In the UK the development is continuing of portable anti-aircraft missiles able to be launched from the shoulder by one man. The Ministry of Defence has a requirement for a high-velocity missile, to be used from a light multiple launcher.

The MoD considered pro
fence Initiative Organisation is at the focus of advanced technology developments. The "Star when 10 missiles will provide an initial operating capability. The full procurement of 100 missiles will provide an initial operating capability. The full procurement of 100 missiles is expected to be completed in 1990.

The full procurement of 100 missiles will provide an initial operating capability. The full procurement of 100 missiles is expected to be completed in 1990.

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The small intercontinental ballistic missile could be in service with an initial operating ballistic missile could be in service with an initial operating capability. The small intercontinental ballistic missile could be in service with an initial operating capability. The small intercontinental ballistic missile could be in service with an initial operating capability. The full procurement of 100 missiles will provide an initial operating capability. The full procurement of 100 missiles will provide an initial operating capability. The full procurement of 100 missiles will provide an initial operating capability. The full procurement of 100 missiles will provide an initial operating capability. The full procurement of 100 missiles will provide an initial operating capability. The full procurement of 100 missiles will provide an initial operating capability. The full procurement of 100 missiles will provide an initial operating capability. The full procurement of 100 missiles will provide an initial operating capability. The full procurement of 100 missiles will provide an initial operating capability.



Short Brothers, is designed to meet the widest range of low-level air defence

The US is developing a high endoatmospheric defence interceptor (HEDI) missile, as part of its SDI initiative. The HEDI operation.

The US is developing a high launchers," designed by Boeing and a seven-mile range shipmendoatmospheric defence interceptor (HEDI) missile, as part being tested for cross-country of its SDI initiative. The HEDI operation.

Matra, the French manufacture. is designed to be launched from the ground to intercept ballistic missile re-entry vehicles in the upper atmosphere. The first flight tests of the HEDI are expected to take place in 1989.
In the conventional role, the
US Air Force is to request
\$167m in the 1987 fiscal year for research and development of a second-generation shortrange attack missile (SRAM II) for the Rockwell B-IB and the Northrop advanced technology bomber, the "steakth" air-craft. The USAF is studying stand-off weapons under a NATO Programme.

The US is developing two intercontinental ballistic missiles, the Peacekeeper, formerly called the MX missile and the small intercontinental ballistic missile (SICBM). The US Peacekeeper MGM-118

strategic ballistic missile, is to

The People's Republic of China has developed its own intercontinental ballistic missile, the CSS-4, capable of carrying a nuclear warhead. The missile was tast-fired in Sec. missile was test-fired in Sep-tember last year.

In France, Aerospatiale and Thomson-CSF have started studies of an anti-tactical ballistic missile (ATBM). This could eventually become a part of a European network to counter short-range missiles. short-range nuclear missiles. The proposed new missiles could also be used to protect the French land-based nuclear deterrent, in the 1990s.

France has suggested, in talks at official level with the UK, that Britain could collaborate on the auti-missile defence system. These discussions have taken place in parallel with efforts by the French Defence Ministry to interest the West German government in the sys-

Matra, the French manufac-turer of guided missiles, has an ambitious programme of de-velopment to meet demand in the 1990s. The company has in-production or is developing production, or is developing, about a dozen missiles for the next decade, including the MICA air-to-air missile to be completed by 1990. MICA is to compete for export sales with the AMRAAM and ASRAAM.

France wants to equip its navy with an advanced anti-missile system in the 1990s, with a range of 15 km, Thomson-CSF is the prime contractor for the surface-air anti-missile system, SAAM, and is designing the radar and fire control system for the missile. Matra and Appropriately are appropriately and Appropriately are appropriately and Appropriately are appropriately and Appropriately and Appropriately are appropriately and Appropriately are appropriately and Appropriately are appropriately appropriately are appropriately appropriately are appropriately app and Aerospatiale are competing to make the missiles. Aero-spatiale is offering its Aster-missiles and Matra is offering versions of its SAMAT.

In Canada, the national In Canada, the national defence department earlier this year chose a team led by Cerlikon-Buhrle and Litton Systems Canada to produce its Canadian \$800m low-level air defence system. The proposals were based on the air defence anti-tank, system defence anti-tank system (Adats) developed by Martin Marietta for Oerlikon.

Lynton McLain





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MCDONNELL DOUGLAS

ic 1986 McDonnell Douglas Corporation

Marked decline in US sales

BUSINESS AND general avia- Government's decision in poses a serious problem at these tion has faced two major devergence to the CAP 522 report, two airports."

In the US, home of the world to make exemptions. business and general aviation The Government considered industry and source of the majority of aircraft owned or tional rules on restraining air-

Transport on the subject of air airlines' scneuums commended traffic distribution in the London area, recommended a total blems caused by steadily-rising executive of the Business Aircraft Users' Association, critical commended and the CAA for "unnecestated and the CAA for "u

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lon has faced two major developments in the past year.

In the UK, the most controversial issue has been the civil
Aviation Authority report, CAP

522, on runway and airport
capacity in the London and

response to the CAP 522 report,
said that the Government would
give priority to passenger airlines at peak hours by banning
general, business and all-cargo
flights at Heathrow and at Gatwick at those times. The

used by companies for business, port use by any categories of sales of new aircraft have stag-aircraft until it became nated and in some cases fallen absolutely necessary—that is, by their greatest amount since when existing runway capacity the second world war. was saturated.

The Civil Aviation Authority, in its final advice to Mr John of allocating take-off and land-moore, Secretary of state for Transport on the subject of air airlines' scheduling committees demand.
In the meantime, the Depart-

The asssociation argued that it had been possible so far to accommodate the needs of business aviation at Heathrow and Gatwick, "despite planned fullwick at those times. The capacity by scheduling com-Government reserved the right mittees."

Business aviation is the sector of general aviation con-cerned with the operation of sircraft by companies for the carriage of passengers or goods as an aid to the conduct of their business. Members of the association include leaders of association include leaders of industry and commerce and "the principal creators of wealth and employment," the association told the Secretary

shortage proportionately among the classes of operators. The association was firmly against any limitations imposed artificially on the basis of class or category of operation.

Business aviation users point out that they need to retain fair access to Heathrow and Gat-wick airports, Connection with world airlines is often neces-sary and some business aircraft have radio aids that can only

The industry has not ruled out the development of suitable relief airports for business traffic in the London area and would encourage these airports to be used by business aircraft, but it wants relief airports to be considered with much of State. be considered Mr Derek Leggett, chief greater urgency.

These airports would have to be properly equipped and pro-vide the same margin of safety

demand.

In the meantime, the Departable airports during the hours that these airports would be at full capacity as indicated in the airline scheduling committees' plans.

The British Airports Authority, the Business Aircraft Users Association and the scheduling committees did not argee with such a ban and said so in their submissions to the Secretary of State for Transport.

In the meantime, the Departable demand.

In the meantime, the Departable dentified the need for a further examination of the use of runway capacity at the London airports and has asked the CAA for a special study.

The Business Aircraft Users' Association should be another arbitrarily taking the soft option by recommending that conditions as the major metroconditions as the major metrocondity, which is the conditions as the major metrocondition



The Beech Starship I is a revolutionary design concept for business and executive alreraft now under development. First deliveries are scheduled for mid-1987

In the US, the biggest single In the first half of the year, market for business and the US general aviation general aviation aircraft, sales industry reported the delivery of new aircraft excluding heli-copters have fallen sharply The results represented a this year, with few signs of a decline of one-third in the The results represented a decline of one-third in the number of aircraft sold compared with nearly 1,000 sold in the first half of last year.

The sales value of the air-craft in the first half this year was almost 40 per cent down compared with the corresponding period in 1985, according to the US General Aviation Manufacturers' Association.

Single-engine aircraft deli-veries, at 483 aircraft delivered, were down 25.7 per cent on the first half last year. A total of 43 twin-engined piston aircraft were delivered, a decline of almost 60 per cent on the period last year.

Business jet and turboprop aircraft accounted for 37 and 86

Gulfstream has begun production of its new Gulfstream 4, expected to receive FAA certification in September. The company has \$1.5bn backlog of orders for the aircraft.

Beech of the US has produced its revolutionary Starship business turboprop made with a completely composite rear-mounted pusher propellers and highly-swept wings with a foreplane ahead of the main

The US business and general aviation industry has been faced with a proliferation of product liability lawsuits. These 43.9 per cent and 43.4 per cent on the period last year.

Three makers delivered fewer than five aircraft in the first quarter 1986: Gates Learjet delivered two Lear 35.4 business jets; Gulfstream Aerospace delivered two Gulfstream three large business jets and a Commander 1000 turboprop; Fairchild Aircraft delivered four Metro 3 commuters.

Despite the current power of the proliferation of product liability lawsuits. These product liability lawsuits. These tributed to the decline in sales of light, general aviation and business aircraft in the US and business aviation aircraft as has helped to depress total sales of commuter and business aircraft from \$2.1bm in 1984 to care understoned in a law-suit.

This type of concern has commuter to light, general aviation and business aircraft in the US and business aircraft from \$2.1bm in 1984 to care understoned to the decline in sales of light, general aviation and business aircraft in the US and business aircraft from \$2.1bm in 1984 to care understoned to the decline in sales of light, general aviation and business aircraft in the US and business jets; Gulfstream three care to be restored to anything like their usual levels. Sales of commuter and business aircraft from \$2.1bm in 1984 to care understoned to the decline in sales anything like their usual levels. Sales of commuter and business aircraft in the US and business aircraft from \$2.1bm in 1984 to care understoned to the decline in sales of light, general aviation and business aircraft in the US and business aircraft from \$2.1bm in 1984 to care understoned to the decline in sales of light, general aviation and business aircraft in the US and business aircraft from \$2.1bm in 1984 to care understoned to the decline in sales of light, general aviation and light, general aviation and business aircraft in the US and business aircraft from \$2.1bm in 1984 to care understoned to the decline in sales of light, general aviation and light, general aviation and light to the decline in sales of light to the decline in sales

fetro 3 commuters. A typical comment on the Despite the current poor impact of the product liability

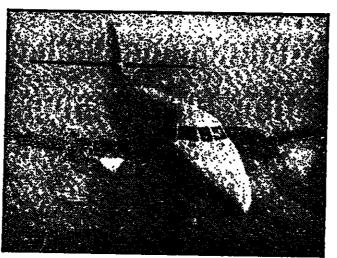
sales outlook, some manufac- lawsuits on sales of general thrers continue to develop new aviation aircraft and their types. Frederick Sontag, president of Unison Industries, in evidence to the US House sub-committee on transport, aviation and materials.

The company makes magnetos and ignition wiring for general aviation aircraft, but recently scrapped a year's engineering research on a new electronic ignition product.

"The reason we did so," he said, "was not economic or technical. We were mostly concerned with the potential pro-The aircraft uses 25 per cent duct liability risk of such an less fuel than a comparable business jet, according to Beech, and is designed to carry eight to 10 passengers over a subjecting ourselves to some distance of 2,250 nautical miles. The US business and general aviation industry has been cerned with the potential product liability risk of such an innovative product. We were afraid of becoming a technological ploneer and potentially subjecting ourselves to some plaintiff's aftorney second guessing our decision in a law-aviation industry has been

Lynton McLain





Left: Interior of a British Aerospace 125 Series 800 twin-engined executive jet, the latest version of this highly-successful aircraft, capable of non-stop flights of 3,000 miles. Above: the Jetstream 31, the company's commuter airliner which has also made its mark.

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New Techniques

Revolution in technology

AS THE costs and complexity of modern military and commer-cial sircraft, guided weapons and space hardware continue to ise, the aerospace industry, for many years a pioneer of new techniques of manufac-ture and of new materials, is stepping up its own efforts to generate and exploit further technological advances. And it is encouraging its suppliers in many other industries to do the

quirement is for more efficient. lighter, faster, more agile, stronger and cheaper aircraft then in the past, and this requires more complex manu-

faculting techniques.

The prime requirement in commercial aircraft, apart from strength and safety, is for reductions in weight to save fuel and bring down operating costs for the sirlines—savings which can be passed on in lower fares and rates to passengers and cargo

In guided weapons, meticulous precision in performance at very high speeds is essential; while in space hardware, whether satelities or manned spacecraft, durability of performance in an exceptionally allen environment

The demands that all these requirements place upon materials, systems and struc-tures are exceptionally severe, and throughout the world the aerospace industry is continually seeking improvements in all fields to keep costs within acceptable limits for the ultimate customers, whether govern-

Other requirements are also coming more stringent. Manufacturing times must be reduced, not only to help keep costs down but also to ensure that an individual company's or country's products are not

overtaken by competitors.
At the same time, the changing environment in which many aircraft and spacecraft are being required to operate—such as at greater altitudes and at greater speeds—is also leading

The demand for a " common " wing for the next two European Airbus models, for example, the A-330 and A-340, one a twin-engined and the other a fourengined aircraft, is already stretching the aerodynamic design talents of British Aero-space, despite the fact that it is already one of the greatest air-liner wing specialists in the

100.5

In other areas also, major advances are being sought and achieved. The need for greater agility in combat aircraft has already led to the development of new systems of in-flight con-trol, such as: "fly-by-wire," where electronic signals control the manoeuvrability of the air-craft, and this is leading on to

the use of fibre-optics, or "fiv-by-light." British Aerospace has done much work in these fields, especially with the "fly-hywire" Jaguar demonstrator, with the result that the current Experimental Aircraft Programme (EAP) uses this system and it will be incorporated into the forthcoming Eurofighter it-

The use of computer-aided design and manufacturing (CAD/CAM), largely pioneered in the aerospace industry but in the aerospace industry but now widely used throughout general manufacturing indus-try, is still one of the basic tools of aircraft design, development and manufacture. But in many companies on both sides of the Atlantic it has been, and is being carried to new heights of refinement.

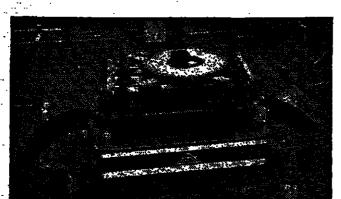
of refinement.
For example, at British Aerospace, it is being applied to the design and manufacture of jigs and fixtures required in the manufacture of detailed airframe components. At the street was extensive use

airframe components. At the same time, more extensive use of robotics is being made.
British Aerospace's military aircraft division at Warton, Lancashire, has also pioneered the development of what is called the "flexible manufacturing system," involving the complete automation of small parts manufacture from the receipt of the raw materials through to the finalised component ready for assembly on an aircraft, with the minimum amount of operator intervention.

wention.

Using minerically-controlled machines under computer control, this system is generating savings of up to 80 per cent in manufacturing time, while reducing unit costs by 70 per cent, work in progress by 90 per cent, and the cost of stock by 85 per cent. BAe's Warton factory is now one of the largest numerically-controlled manufacturing plants in Europe. At British Aerospace, extensive use of new materials has also been progressively exploited to reduce manufacturing three and costs, especially in advanced military aircraft where more complex shapes are required than on sircraft of the past. These activities have been particularly applied to the fisom Experimental Aircraft Programme (EAP). Aircraft Programme (EAP).
which is a "technology demonstrator" for the forthcoming Eurofighter, and will also be include new techniques for the applied to the latter sireraft, manufacture of engine com-Extensive use is made of carbon fibre composites, which offer a reduction of 30 per cent in manufacturing costs because

material on the latest engines, giving considerable weight



Automatically-guided vehicle carries a turbine disc in one of Rolls-Royce's Derby factories. Rolls-Royce has introduced an extensive integrated manufacturing system (AIMS) to automate and cut the costs of manufacture

clude the use of composites

based on carbon fibres, now

applied to major non-rotating

parts of engines such as cowling

panels and by-pass ducts in

order to reduce weight and

Kevlar, the carbon fibre com-posite made by Du Pont, is used as a fan-blade retaining

of detailed parts, along with increased strength-to-weight ratios, a reduction in waste materials and easier produccould be overcome successfully. Rolls-Royce is now running ceramic turbine blades on a demonstrator engine. ion of large, complex, curved Other material advances pioneered by Rolls-Royce in-

out in BAe on super-plastic forming and diffusion-bonding techniques which appear to be well suited to the use of titanium, enabling this strong, lightweight metal to be formed into complex shapes. Such techniques are used in production of wing components for the A-320 Airbus, offering dramtic weight-saving benefits, and will also be used on new generation of advanced military aircraft.

Super-plasticity is a phenomenon which occurs in a number of metals which have (certain alloys of aluminium titanium and steel) whereby at temperatures of about 50 per cent of melting point, netal assumes a so-called super-plastic condition." metal

In this state, and under load, the metal will deform at near constant stress to give the complex shapes required in aircraft manufacture.

In addition to weight savings and a higher level of damage tolerance, such parts can be reduced in number, while also allowing for reduced assembly and fabrication time, thus resulting in lower manufactur

ing costs.
Diffusion-bonding, in simple terms, is where a number of suitable pieces of metal are pressed together at a critical grain structure causing atomic diffusion across the joint line. The resulting structure comes a single piece of metal —the joint line disappears.

At present, for aircraft design purposes, this process is applied to titanium alloys, with result-ing structures that are com-petitive in terms of both cost and weight, with carbon fibre composites and conventional aluminium alloy designs. At Rolls-Royce, considerable attention is paid to what the company calls "the management of technology." This mvolves keeping under review all the economic and competitive factors which affect the future of its business.

Advonced technology and demonstrator programmes are undertaken so that Rolls-Royce can keep its options open and make thet most of business opportunities offered by new engines and developments of current ones when these arise. Research and technology demonstrator programmes prove the effectiveness and practicability of technical practicability of technical advances at relatively low cost before they are applied to an engine which will go into development, production and

This ensures that technology This ensures that technology for new engines is proven in advance. This "up-front" expenditure on technology has reduced overall engineering costs by up to 60 per cent.

Specific recent developments in new technology by Rolls-Regret include advances in en-Royce include advances in en-Royce include advances in engine turbine blade manufacture,
whereby the crystal line grain
structure of blades is controlled while they are being
cast. This has led to directionally solidified (DS) and singlecrystal (SC) turbine blades.
DS blades are cooled in such a way that the molten metal solidities as crystals stretching the length of the blade—giving

solidifies as crystals stretching the length of the blade—giving greater strength in this direction to carry its high centrifugal loads. These blades are more reliable and have a longer service life than those with a crystal structure providing the same strength in all directions. SC blades are cast in a manner similar to the DS process, but arranging for the whole blade to solidify as a single crystal of high-strength metal.

Rolls-Royce has designed advanced computer-controlled facilities for the manufacture facilities for the manufacture of DS and SC blades which are

of DS and SC blades which are unique to the company, it is also a leader in non-destructive testing and techniques for checking whether the crystal axes within SC hiades are correctly aligned to provide the required strength characteristics.

other advances being studied

manufacture of engine com-ponents including those based on powder metallurgy.

Ceramics, too, have long offered the promise of being an effective high-temperature effective high-temperature material for turbines if adverse

savings over the steel retention rings used on earlier high-by-pass turbo-fan engines.

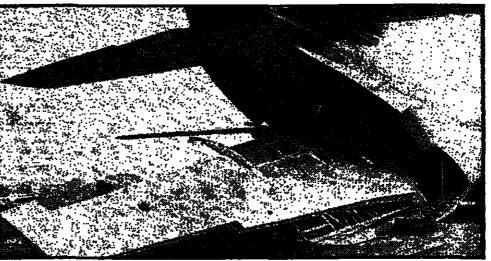
Rolls-Royce has pioneered in many other advances in aero-engine development, including the application of computers to wide range of research, ign and manufacture, tesign and manufacture, together with the construction of major new advanced test facilities such as new noise facility at Rucknall, an advanced compressor test facility at Derby and a turbine test facility at Bristol.

The company has built a new gearbox test rig for work on the forthcoming generation of prop-fan engines.

The introduction of advanced machining centres and robot handling has made it possible to produce engine parts faster, more efficiently and more economically and to reduce the large inventories of work in progress that were typical of engine manufacture in the past,

There are many other new techniques of manufacture, and new materials, now moving into aerospace. The advanced technological revolution has effectively only just begun, and over the next few years it can be expected to accelerate, as the requirements of civil and military aviation themselves more stringent and

Michael Donne



Wings built by Short Brothers of Belfast for the Dutch Fokker 100 jet airliner are loaded into a giant freighter of Heavy Lift Cargo Airlines for shipment to Amsterdam

Air cargo

Fall in tonnage carried

THOUGH WORLD air freight recovery from the recession in activity showed a significant improvement during the 1982-1984 period following the air-line recession of the early 1980s, culminating in a 9 per cent growth in the tonnage carried in 1984, last year there was a small decline, to 13.2m freight tonnes carried. This fall is attributed to the slowing down in the rate of

which has apparently also con-tinued into the early months of 1986, especially on the North Atlantic route.

Figures Issued by the British Airports Authority (now BAA plc) for the first six months of 1986, for example, indicate

some of the Western world's handled by its seven airports major economies during 1985, (including Heathrow and Carly which has apparently also at 740,550 metric tonnes

> This situation is widely regarded in the air transport industry as temporary. At the current level of more than 13m freight-tonnes, air cargo is still at its highest ever, reflecting

the increasing interest being shown in freight as a potential contributor to revenues and profits among most of the major urlines in the Western world.

In many airlines, vigorous efforts are being maintained to overcome current problems and ensure a resumption of growth in the years ahead. There is flerce competition not only nerce competition to only between airlines and freight forwarders but also between individual airports, to win the business that is available and promote further expansion

In the UK, these efforts are being spearheaded by BAA pic through its London Air Cargo Promotion Group (called the Task Force) which brings together all elements of the air cargo industry to promote the concept of the UK, and the London area in particular, as a major air cargo centre.

The Task Force's "Gateway London" message has been carried to many parts of the world, and last May the sales promotion drive was taken to the Far East, via Tokyo and

The efforts of the Task Force in 1985-86 resulted in London overhauling Paris to take second place (after Frankfurt) in the European air cargo league—the first change since 1981-82.

BAA plc points out that the opportunities for London to recapture lost traffic and to gain new business remain "very good," but it adds that industrywide consultation and co-operation "must be supported and strengthened if London is to regain its position as the premier European cargo gateway to the world."

MD

FIGURALISM FROM FROM THE SECOND SECOND

September 1986, the world of business aviation meets its leader, the Falcon 900, at the Farnborough air show.

Recognized as the leader by aviation experts who flew it, the Falcon 900 is not a project any more: it flies... and production follows on.

A leader in comfort, the Falcon 900 sets new standards in the balance of cabin proportions, volume, light and silence. The degree of engineering knowhow applied to the most trivial elements of comfort is astonishing.

A leader in performance, the Falcon 900 is not only allowing ample intercontinental range, it also has the lowest approach speed and the highest speed limit. It may cruise at 0,85 times

the speed of sound but proved it can fly at ·94 Mach.

A leader in optimization, the word to express an unceasing quest for efficiency, the Falcon 900 is optimized not maximized. Thus, taking off for its maximum trip, the Falcon 900 will weigh 21.000 kilogrammes, 10 tons less than its competitor, yes... one third less weight. Efficiency is also in the modern systems in ever more reliable and thrifty Garrett engines. It is also in a degree of maintainability never reached before.

A leader in safety. With the reliability of three engines and their associated systems, with the famous Falcon control system and flying qualities that pilots appreciate in every flying condition, the Falcon 900 embodies the solid strength of good engineering.

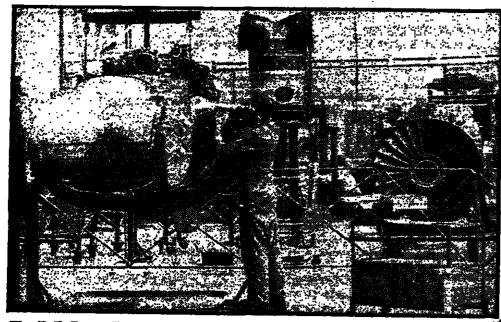
Aerodynamics, flying features, quality of engineering issued from wide and far reaching experience, design for availability, every feature qualifies the new leader in the world of business aviation. The Farnborough air show this year offers you a chance of meeting the

Falcon 900. A business meeting to be given high priority in your schedule...

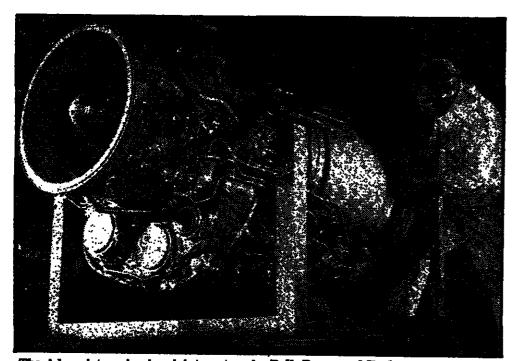
Dassault International chalet 1 - 4 row C / stand NE 5-2

Business takes off with Falcon_

Pratt & Whitney's latest "high-thrust" turbo-fan jet engine is the PW-4000, for Boeing 747 Jumbo jets, tri-jets and wide-bodied Airbus aircraft



The Rolls-Royce Pegasus 406 is the latest production version of the vectoredthrust jet engine used in the advanced British Aerospace-McDonnell Douglas AV-8B Harrier II fighter for the US Marine Corps



The Adour jet engine is a joint venture by Rolls-Royce and Turbomeca of France, for the Jaguar jet fighter and the Hawk fighter and trainer aircraft

Engines

Waiting for the prop-fan era

major aero-engine manufacturers continue to spend condevelopment of turbo-fan (jet) and turbo-propeller engines of all kinds, in the certainty that these types of power-plant will remain in airline service well into the next century, an increasing volume of investment is now being devoted to a new development—the prop-

Various claims have been made for this type of propul-sion — that it can offer reductions of up to 40 per cent in fuel consumption compared current generation turboturbo-fans now under develop-ment, together with less noise and pollution, while also

and pollution, while also yielding aircraft speeds equivalent to those provided by jet engines themselves.

Such claims have to be proved, however, but if they can be justified, the prop-fan engine will clearly be a formidable competitor to conpropeller propulsion. Already extensive prop fan research is being undertaken by all the major engine manufacturers, and interest in the concept is

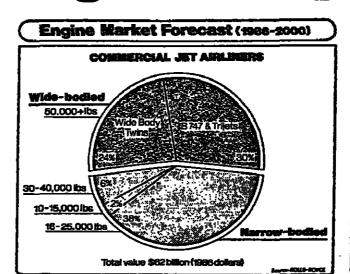
Fundamentally, the prop-fan is a derivative of the already well understood concept of harnessing a propeller to a gas-turbine engine to provide turbo-propeller power. The differences lie in the design and number of propeller blades — usually up to 16, mounted in two sets of eight on two counter-rotating hubs, and designed rather like scimitars or ships' screws instead of the conventional

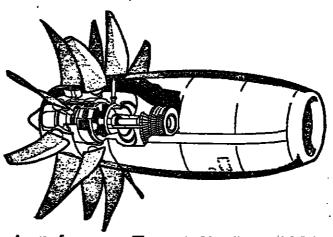
Also, the design of the gas turbine engines themselves has been improved to give substantially greater efficiency. The combination of these developments generates the fuel savings and other benefits claimed for the prop-fan.

Work on prop-fans has been under way for several years, especially in the US where a programme starting late this National Aeronautics and Space Administration and the aero-engine manufacturers has resulted in plans for flight-test programme starting late this summer and next year on various prop-fan engines, using blades built by Hamilton Standard of United Tech-

road with its GE-36 engine, which is to be tested on a starting late this summer. This Boeing has gained a 25 per cent will be designed to provide financial and engineering sufficient confirmation of development stake in the 717 earlier predictions to enable from the Japanese aerospace earlier predictions to enable GE to put the engine into production around the engine into the ship agreements with Short search and Boeing to press ahead with its plans to launch a 150-scater prop-fan powered airliner, the 737, in the first half of 1987, for entry into service in 1982.

At the same time, much work has been done by the Allison Division of General Motors, in looking for additional partners, withing, on another, smaller, whitney, on another, smaller, major world airlines to determine the smaller of the executions of the stations of weightlessness or might already have felt commons. Such forecasts look a raise of case of the prop-fan around the engine into the motor of the stations of weightlessness or might already as the prop-fan around the engine into the first search and the prop-fan around the engine indo truths of the search of the stations of weightlessness or might already as a protocometry of the stations of weightlessness or might already as a protocometry of the stations of weightlessness or might already as a station alre GE to put the engine into pro-





A prop-fan engale. The gas-turbine "core" (right) generates the power to turn the counter-rotating hubs (left) on which are mounted several propeller blades, shaped rather like ships' screws. These blades can be "open," as shown, or "ducted," surrounded by a nacelle

prop-fan engine, the 578DX, mine the most popular interior which will be flight-tested in a layouts for their prospective McDonnell Douglas airliner airliners.

But there is still much to do. next year. If successful, that flight test will be followed by further tests of the GE engine in the MD-80 aircraft.

The object of both tests will factorily settled before the aircraft can be be settled for the sir-

in the MD-80 aircraft.

The object of both tests will factorily settled before the airbe to help McDonnell Douglas craft can be accepted for to refine its own ideas on a service, in addition to confirming the fuel consumption claims.

MD-91X, which it plans to offer the airlines next year for service in 1991.

A bigger, 160-180 seat air
A bigger, 160-180 seat air
Aliso, there are differing views on the merits of different designs—gearboxes (as in the Allison-Pratt engine) against

A bigger, 160-180 seat air-liner, the MD-94X, could be built for delivery in 1994, to rival the Boeing 7J7. Mr James summer and next year on various prop-tan engines, using blades built by Hamilton Standard of United Technologies.

General Electric is probably further down the development road with its GE-36 engine. Both the Boeing and Douglas

ventures involve extensive international collaboration,

Pratt and 50,000+ibi PW4000 5-40,000 b PW2037 JT8D 6-25,000 lbs **Y2500** V2500 10-15,000 lbs

The Competition in Aero-engine

smaller 150-seater airliners, but also "ducted rotors," which are

Rolls-Royce is committing considerable technical resources to this work, which is aimed at the possible start of full-scale production in the 1990s. The research has included the con-

the prop-fan engine in the smaller aircraft, such as the 150-seater 7J7 and 100-seater MD-91X in the early 1990s, Rolls-Royce believes that the biggest market in terms of value will emerge in the larger aircraft of over 200 seats for medium to long ranges, such as new-generation tri-jets or Jumbo jets, in the mid to late 1990s. Much of Rolls-Royce's prop-fan work is thus currently being directed towards engines for the bigger aircraft, with studies

reality. "When GE announced its intention of building a counter. commuter-size prop-fan transport, the MPC-75. A feasibility world-beating fuel efficiency, the industry had doubts," says the company, It has been done. The model whether the market would support full-scale developments in the would support full-scale developments in the market would support full-scale developments in the model.

gearless engines (as in the GE

prop-fan). But GE itself appears to have

no doubts. It says that its engine, which it calls an "Unducted Fan" or UDF (others call their prop-fans "Ultra High-Bypass" or UHB engines and there are already

many variants on the trade names involved), is already a

larger engines with shrouds or nacelles round the propellers.

This makes them suitable for underwing installation on bigger aircraft such as the Boeing research into nacelle technology, and research into nacelle technology, and research into engine installation in continuction with him

research has included the con-struction of a new test facility for gearboxes transmitting up to 15,000 hp—such gearboxes being likely in its view for future prop-fan engines.

While recognising that there will be substantial interest in the prop-fan engine in the

on what the company calls a "contra-fan" engine which might be suitable for new versions of the Boeing 747, such as the Series 500 for very long ranges in the mid to late 1990s. Already its studies have indicated that it would be possible to develop an engine of reduced length and weight compared with original design ideas.

In West Germany, Messerschmitt - Boelkow - Rlohm has signed an agreement with then decide whether the market would support full-scale develop-

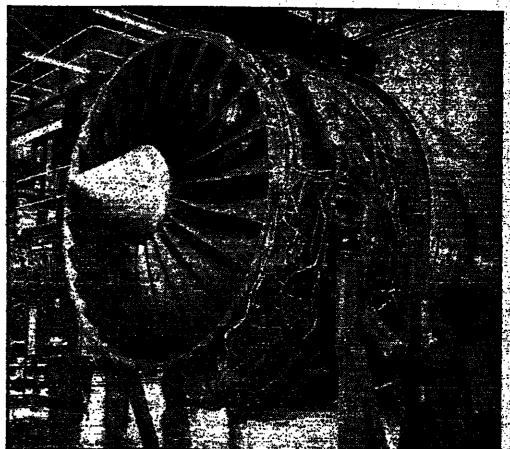
and research into engine instal-lation in conjunction with air this could lead to a "demonstrator engine" programme at the end of this decade.

At the same time, Motoren-und Turbinen-Union (MTU) of west Germany has begun work on a "shrouded" (with a nacelle round the propeller blades) prop-fan engine, that could become a rival to the 25,000 lbs thrust V-2500 conventional turbo-fan engine now under development by Inter-national Aero-Engines for the forthcoming Airbus A-520 twin engined jet airliner.

Called the Counter-Rotating Integrated Shrouded Frop-tan (Crisp) the initial development programme, leading up to windtunnel testing in late 1987, will last a year, after which develop-ment would probably be under-taken on a collaborative partner-

ve already partners in the IAE vestor programme.
One possible outlet for such an engine could be in the Airbus A-820 itself by about the that williner from becoming obsolete when the rival Boeing 7J7 150-seater operational in 1992. The pro-jected MTU engine could also be used in the projected A-330 high density medium-range and A-340 long-range sirliner

Also in Western Germany, Dornier, which builds the small DO-228 turbo-prop commuter airliner, has begun studies that viation, to co-operate on could lead to development of a small propian aircraft of about 26 seats that would rival



Latest version of the highly-successful Rolls-Royce RB-211 engine is the 524D4D of about \$8,000 lbs take-off thrust, already ordered by Cathay Pacific Airways, and now also ordered by British Airways for the Boeing 747 Series 400 Jumbo jet

Western confidence takes a knock

THE STEADY progress towards increased commercialisation of space ventures in the West has come to an abrupt halt with the series of rocket accidents which is operated by Ariane-tome to an abrupt halt with the series of rocket accidents which is operated by Ariane-tome to an abrupt halt with the space, a company based near launching industry. It has cast launching industry. It has cast launching industry. It has cast involving the vehicle's third-apall, at least temporarily, over ambitious plans in the US and Western Europe for a manned western Europe for a manned street space missions. Ariane is a conventional expendable Western Europe for a manned space station in the 1990s.

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In July, two Soviet space men. Vladimir Soloyov and Leonid Kizim, completed a four-month stint shuttling between the two

The spotlight has turned, too, on the space activities of China and Japan. China is offering launch services to the West with its Long March 3 rocket these vehicles or previous generations have lifted into space about 20 satellites, all of them Chinese — while Japan is quietly developing the foundations for an impressive space programme of its own, including even a Japanese version of

the space shuttle.
Overshadowing the West's space industry is January's dis-

western Europe for a manned space station in the 1990s.
Meanwhile, the focus of international attention in space activities has shifted eastwards. The Soviet Union has already launched about 40 satellites this year; has sent into the heavens a new, improved space station; and in what amounts to a series of space-age taxi rides, has ferried cosmonauts between this and an earlier station already in

and an earlier station already in of next year.

These problems would be less important but for the decision made by Nasa some years ago to concentrate on the Shuttle for launchers, leading to the stopping of production of the Delta and Atlas-Centaur expendable rockets which have successfully delivered objects into space for more than two de-cades.

year. But companies are likely Besides Western Europe, Can- have little option but to disband to think twice about putting in a submission when they regime other research. a submission when they realise that launching the satellite will be extremely unlikely in this period because of the queue building up for Ariane and the Space Shuttle.

as and Japan are due to be the other partners in the venture, which is meant to provide orbiting workshops for experiments in areas such as materials science together with a space outpost for trips further into the soles greaters.

Besides holding up satellite schemes for TV broadcasting schemes for TV broadcasting and telecommunications, the launch hiatus may also affect replacement of the ageing satellites currently in orbit for yeather or taking high resolution pictures of the Earth's surface.

The shuttle explosion has similar. The lead by the USSR in this area is already worrying many in the US.

The solution has grievously damaged confidence in this kind of venture. More to the point, some of the \$80n and telecommunications, the grievously damaged confidence in this kind of venture. More to the point, some of the \$80n and telecommunications, the shuttle explosion has grievously damaged confidence in this kind of venture. More to the point, some of the \$80n and telecommunications, the shuttle explosion has grievously damaged confidence in this kind of venture. More to the point, some of the \$80n and the USSR in this area is already worrying many in the US.

The solution placement of the ageing in this kind of venture. More to the point, some of the \$80n and the USSR in this area is already worrying many in the US.

West could turn for launches

Overshadowing the West's space industry is January's disastrous explosion of Challenger Killing seven astronauts.

Challenger was one of the US National Aeronautics and Space Administration's fleet of four Space Shuttles. Pending design changes to the faulty rocket boosters, which were the cause of the explosion, the remaining of the explosion, the remaining of the explosion, the remaining of the explosion of Challenger will not fly again before 1988.

Of them are resigned to long problems for many Western and some may governments.

Ambitious plans to bring into the space business companies planned. This could well entail the space business companies planned. This could well entail dropping ideas to involve the other nations—or put back the laws powerful dustry have also been suffected. There had been sugsticated base that was planned. This could well entail dropping ideas to involve the other nations—or put back the laws powerful dustry have also been suffected. There had been sugsticated base that was planned. This could well entail dropping ideas to involve the other nations—or put back the large and stopping ideas to involve the other nations—or put back the large and stopping ideas to involve the other nations—or put back the large and stopping ideas to involve the other nations—or put back the large power rival affected. There had been suggestions that by the end of the century manufacturing are supposed to be using space platically and the large and station instead of the large and stat

into the solar system, and for satellite repairs.

Earth's surface.

According to space analysts, the Chinese, Japanese and Soviet rockets to which the Chinese to contribute a further 34bn or so) may now be required to fund a replacement vehicle for Challenger, the cost of which would be about \$2.50n. Nasa suffered a severe public

Cades.

Over the next two years, governments and companies had planned the launch of about 30 commercial communications atellites in either Ariane or the Space Shuttle.

West could turn for launches are mainted a solution. These are unlikely to take lenger accident and the US congress is unlikely to be as of Western satellites over the next decade — the Chinese and agency's schemes as in the past.

Japanese rockets are relatively The US Government now has the decide whether to scale Following the rocket failures, these organisations have received major setbacks. Most of them are resigned to long postponements—and some may abandon their establities wantered.

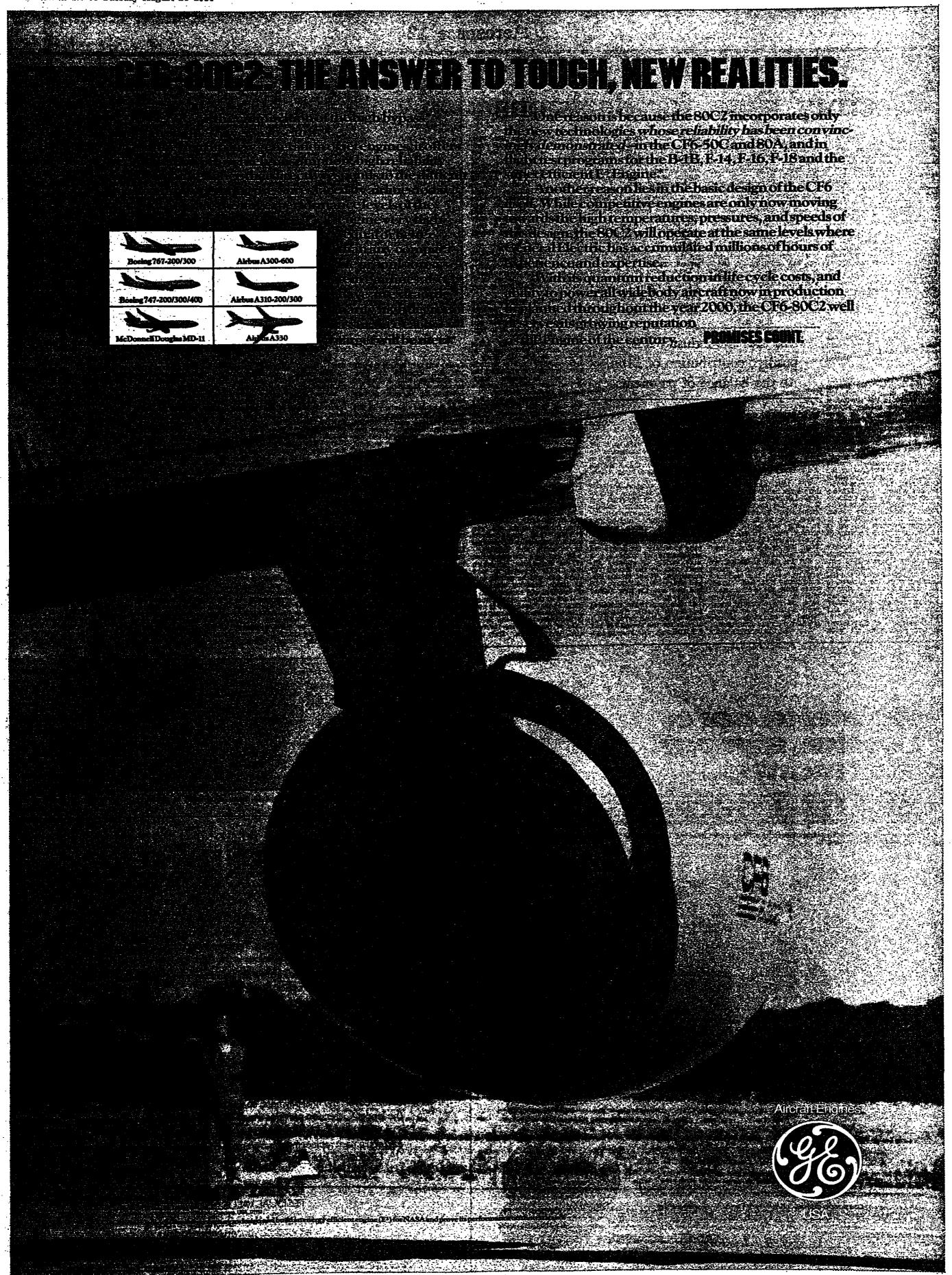
teams built up since the early 1960s to work on manned space

National prestige, meanwhile, will see to it that so long as the Soviet Union keeps up its space station plans, the US will be forced to do something similar. The lead by the USSR

in February by the first of a new generation called Mir. Inside these capsules, people Inside these capsules, people have fived and worked for up to eight months at a time, conducting a variety of scientific experiments and learning the experiments of space habitation.
It appears likely that the Soviet Union has its eyes on a manned trip to Mars, perhaps some time soon after 2000. Such a venture would be a huge political boost—and would can-cel out America's success in 1969 in reaching to the Moon

The desire to match its super-power rival in extraterrestrial ventures will continue to be a powerful driving force in the US space programme—and will ensure that the country cannot simply pull out of or scale back space plans even when financial and industrial logic suggest that

Peter Marsh



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The UK

Testing time for decisions

Last year the industry made a

positive contribution of £1bn

to the balance of payments

THE UK aerospace industry is range of products already in skilled and responsible working ALF-502Rs for Bae 146s, heading for another record year production or under develop- force, and this, together with and for the International Aero- for turnover, exports and a ment, an equally significant part the other strengths, would make Engines IAE V-2500 for the for turnover, exports and a ment, an equally significant part positive contribution to the UK's of the industry's future depends balance of overseas trade.

is awaiting some major government decisions on new ventures

At the same time, much solidate our progress."

The company's sales in 1986

depends upon the freedom of the company's sales in 1986 ing for new versions of the European Airbus; and future space development plans—as well as decisions on the privatis-ation of Rolls-Royce and Short

Brothers.
All of these will have far-All of these will nave large reaching implications for the for the future.

Industry's future workload, export performance and profitability through to the end of ability through to the end of the end of the condition of th

the century.

Annual turnover of the UK Annual turnover of the UK industry in 1985 amounted to well over £7bn, compared with close to £2bn in 1975. Over the same decade, the industry's exports rose from £750m to like the same to the same and Short Brothers Government ownership since it will be able to do the same.

Recently, in a message to staff, Sir Francis Tombs, chairstain the it has had a chequered financial history, but has exercise the same of Rolls-Royce would start similarly both the company has been under Government ownership since it was taken over in 1943 during the Second World War. Since the it has had a chequered financial history, but has exercise the same of Rolls-Royce would start similarly both the company has been under Government ownership since it was taken over in 1943 during the same of Rolls-Royce, said that the same of Rolls-Royce would start similarly both the company has been under Government ownership since it was taken over in 1943 during the same of Rolls-Royce, said that the same of Rolls-Royce would start similarly both the same.

Today, the industry exports nearly 60 per cent of its turn-over, or about 8 per cent of the UK's total manufactured exports, and in 1985, the industry made a positive contribution to the balance of payments of

over film.
Overall, the UK aerospace industry employs over 200,000 personnel directly, including some 35,000 in the electronics some 35,000 in the electronics industry, with another 250,000 employed indirectly on aerospace work in other industries

"By then we shall have established a reliable track of profitability and we ceramics, glass, and hydraulics. Few industries, in fact, do not have some relationship, however remote, with aerospace.

Over the past decade, according to figures prepared by the Society of British Aerospace Companies, the serospace industry has exported over £22,50n-worth of its products, which in before tax had been more than tripled in 1985 to £81m. "Now terms of 1985 pounds is worth fallon. Over the same period, the industry's contribution to the positive trade balance is £5.3bn, or in 1985 currency in excess of £8.5bn. craft missiles and now also the new Starstreak high-velocity air defence weapon, selected by the British Army.

In aerostructures, the company undertakes the design and manufacture.

But he claimed Berral

with the Western world's aerospace export markets through to the year 2000 estimated to be worth over \$1,400th (over \$920th), the UK industry is looking forward to capturing a substantial slice of that trade across the entire spectrum of civil and military aircraft, guided weapons and stace hardware.

future we need to achieve some-thing like double that figure," pany undertakes the design and manufacture of parts for a manufacture of parts for a manufacture of parts for a wide variety of overseas air of the Eurofighter, of which craft, such as the Boeing 747 the UK is expected to take Jumbo jet, 757 and 737-300 jets, about 280, will be getting into taken place, the wider range of and now also the new Fokker F-28 its stride, ensuring continuity of workload and employment.

Work on the project definition phase of the Eurofighter is now structures, the communication in Indonesia and Turkey).

By that time, the production of the Eurofighter, of which the UK is expected to take and wings for the Fokker F-28 its stride, ensuring continuity of workload and employment.

Work on the project definition phase of the Eurofighter is now workload and employment.

Work on the project definition phase of the Eurofighter is now workload and employment. Work on the project definition phase of the Eurofighter is now tinued to be, made in new work or the project definition phase of the Eurofighter is now tinue with add been, and community to the project definition phase of the Eurofighter is now the project date in the project date in Indonesia and Turkey).

By that time, the production of the Eurofighter of verseas air of the Eurofighter of verseas air of the Eurofighter of the Eurofighter of the UK is expected to take place, the wider range of the Eurofighter of verseas air of the Eurofighter of verseas air of the Eurofighter of the Eurofighter of verseas air of the Eurofighter of the Eurofighter of verseas air of the Eurofight

space hardware. While much of that future

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the industry to conduct its com-mercial affairs in the way that some £200m higher than in it sees fit, which is why the 1985, with a further rise foreit sees fit, which is why the privatisation of Rolls-Royce and eventually also of Short Brothers are regarded by many in the industry as imperative of Belfast has yet been taken, although the Government has a positively that it is on its

record of profitability and we will, I am confident, be in an

internationally competitive posi-

tion, capable of convincing investors that Rolls-Royce is the company they should invest

The 1984 profit of £26m

I know that sounds a lot of money, but it really is not enough for us to be making

it possible for the company " to Airbus A-320. At the same time, however, it grammes now in the prepara- confidence and to use the oppor-

business in three broad areas. One is the manufacture of civil and military aircraft, including

the civil 330 and 360 twin turbo-

prop commercial transports, and now also the Brazilian-designed Tucano basic trainer

for the RAF.
In guided weapons, the com-

pany makes the Seacat ship-to-air weapon, the Blowpipe and

Javelin man-portable anti-air-

In military aviation, there is the prospect of some slow-down in the tempo of existing activity, as a result of cuts in the overall defence budget (1.5 per cent annually over the next three years) that may force the Government to spread out some programmes over longer periods of time than originally planned and reduce

Already, the Secretary for Defence. Mr George Younger, has indicated that some Harrier GR Mark 5 jump-jet fighters may be cut from orders already announced, and that its introduction into RAF service may be delayed.

Overall, the message coming from the Commons defence debate earlier this summer was that major new ventures will be strictly reviewed as to both

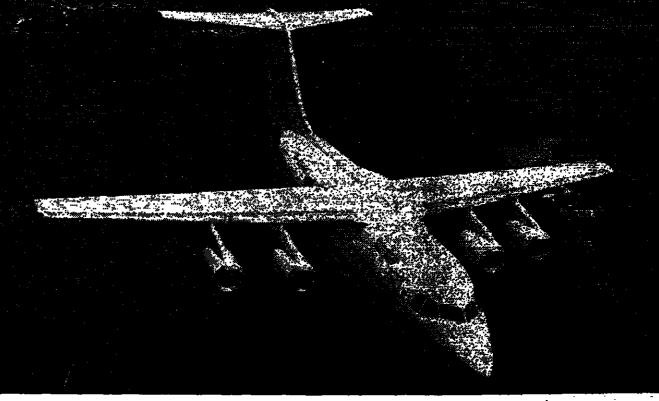
timing and funding.
This situation may affect some current programmes, in addition to the GR Mark 5 Harriers, but there is no indication yet that it will affect the projected four-nation Euro-fighter, now moving towards a critical go-ahead decision. The Eurofighter is essential,

not only to the RAF as a re-placement for Jaguar strike aircraft and ageing Phantom and Lightning jets, but also to the UK military aircraft manufacturing sector which is now over the peak of production of Tornado multi-role combat aircraft.

Production of the latter has been extended as a result of dditional orders recently from West Germany for an air reconnaissance version and from Saudi Arabia and Oman, but even so manufacture is due to end in the early 1990s, unless even further orders are won overseas (and strong efforts continue, especially for example in Indonesia and Turkey).

engines, the solid technology base, and the substantial investments which had been, and continued to be, made in new machine tools and computers.

Above all the company had a minow also the new rocker for the new rocker for the new rocker for the new rocker for workload and employment. Work on the project definition phase of the Eurofighter is now edge to completion (target date is September), and the industries of the countries involved (UK, West Germany, Italy and



The British Aerospace private-venture four-engined Type 146 regional jet airliner, which is selling well, especially in the US

survey, the programme envis-ages over 800 aircraft for the four countries, with eight pro-totypes built to flight test the entire aircraft as a weapons system, and to enable production aircraft to enter service with the air forces involved in

The cost will be substantial, perhaps as much as £20bn, spread over the four nations, and the workload will keep the military side of the UK aero-space and associated industries (such as electronics) busy for many years, probably well into

the next century.
In commercial aviation, the UK industy remains active in the manufacture of wings for the existing range of European Airbuses and manufacture of complete aircraft such as the complete aircraft such as the BAe 146 regional jet airliner, the Advanced Turbo-prop, the Jetstream 31 turbo-prop, the 125 series of executive jets and the Shorts 330 and 360 twin turbo-prop airliners.

British Aerospace, however, the less anyious to restrict the services the services the services to restrict the services the s

is also anxious to participate in the next generation of Airbuses

Spain) will then submit the project for approval by their
governments, with a view to
subsequent launching of full
development as soon as possible.

As discussed elsewhere in this
holder on behalf of the Government, is now planning to for such support at it gets, in develop these for service in the view of the Government's own early 1990s, with a formal desire to keep down public launch expected around the spending and a more critical turn of this year, depending on approach towards launching ald the inflow of launch orders.

Airhous planning to build the in view of next losses in that

Airbus plans to build the two aircraft with many common parts, including wings and fuse-lages, to keep down development costs but, even so, the overall cost has been set at not less than \$2.5bn and it may be considerably more.

This money must come from the partner companies, and so BAe itself expects to have to subscribe perhaps as much as £500m for its share of the work -principally the wings for the two aircraft, the area in which

civil aircraft programmes so that much, if not all, of its contribution to the A-330/A-340 programme will have to be subscribed by the Government as launching aid. At this stat although ready standing on the sidelines stage,

expect to receive the full sum required, and even then will have to make a first-class case for various aerospace ventures in view of past losses in that

It seems likely that BAs will have to seek some alternative sources of finance to top up whatever balance is needed to enable it to participate in the A-330/A-340 venture. The prospect otherwise is that BAe will have no part in that venture, and thus while continuing with its existing Airbus work, will be our of the further expansion of that organisation.

It is a prospect that BAe does it is now one of the world's not like to contemplate, and it experts.

BAe's problem is that its own cash resources are already heavily committed to other in the new Airbus aircraft. What does not seem to be in doubt is that even if BAe cannot gain a share in the A-330/ A-340, those aircraft will be developed, one way or another, with other manufacturers al-

informal discussions have been ready to pick up the lucrative held with the Department of wing business if BAe itself is Trade and Industry, the view not able to undertake it. Were in Whitehall is that BAe cannot that to happen, a major workthat to happen, a major work-load for the UK industry could be lost through the 1990s and

> in space, Mr Roy Gibson, director general of the British National Space Centre, has now presented to the Department of Trade and Industry his National Space Plan. This involves a series of options, or "menus" from which the UK Government can choose, with the highest cost being given to the development of the Hotel trans-atmospheric vehicle discussed

elsewhere in this survey.

A wide range of options is involved, however, including whether or not the UK supports financially the development of the French-inspired Hermes named spacecraft, how much the UK spends on development of its share of the Columbus (Europe's share of the US manned space station), and in the Ariane heavy rocket launcher.

The Government is likely to

study the plan carefully, and it could result in doubling the UK's space budget from £100m a year at present, in the 1990s.

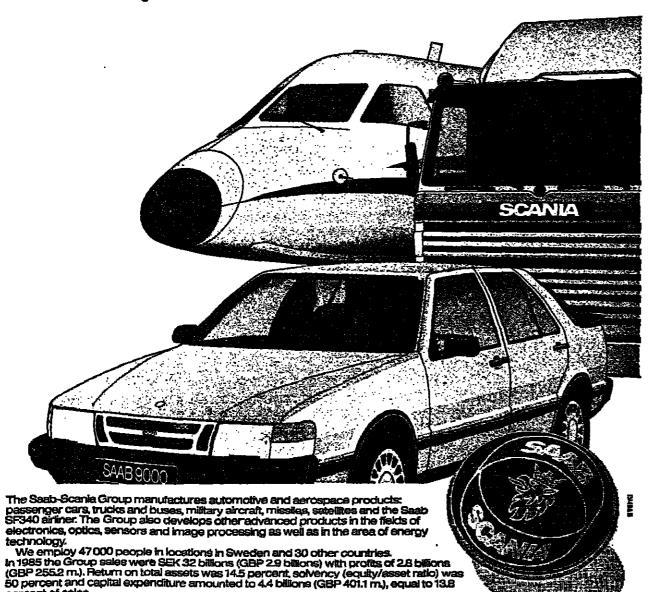
Michael Donne

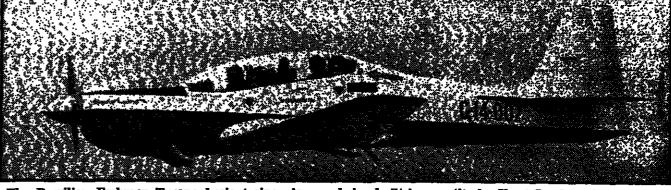
We make cars, trucks, aircraft and money.

And every year we make more of them. So much so, that for the last five years Saab-Scania Group sales have increased by an average of 18% and profits have risen by an average of 24% per year.

This is the result of a determined policy of concentration and specialization in products for well defined market sectors. Areas such as high performance passenger cars, trucks for heavy transport and aircra for regional traffic. In these areas Saab-Scania products have earned a reputation for technical innovati

nd quality. In the field of specialized transport technology the symbol of Saab-Scania is the eign of technical innov





basic trainer is now being built in quantity by Short Brothers for the RAF.

IN AVIATION FINANCE THIS IS NOTIME TO BE FLYING A KITE.

New tax legislation, unpredictable cycles and interest rates, newer aircraft technology, the reticence of airlines to commit themselves for too long to a particular aircraft type... These are just a few of the factors casting a shadow over aircraft resale values in the 1990's.

In addition, new lease accounting standards have increased interest in operating leasing and option financing.

No wonder risk capital is in greater demand - but is it available? Aircraft financiers would undoubtedly feel more comfortable knowing they have an alternative way of looking at asset risk and a new way of

Clarendon Residual Value Insurance (RVI) is the bankable financial instrument that restores order and flexibility.

RVI guarantees a minimum value of an aircraft at a predetermined future date. It covers the final payment, so the asset itself has the ability to repay the lender. Clarendon provides the all-important, alternative balance sheet.

With the airline industry entering its greatest-ever expansionary phase and equipment replacement programme, this is no time for kite flying. Don't enter into negotiation without the facts on RVI.

As the financial instrument with a future, it demands your attention today.

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The US

Sharp variations in earnings

companies which still have a part to play in the commercial airliner sector, and those which are connected with the defence or space business.

Growth in the two areas tends not to rum in fandem, and the differences in the cyclical behaviour of the two industries have been to show up marticulation.

have begun to show up, particu-larly in recent months.

In the commercial airliner business, 1986 looks already as though it will be an outstanding year, with both orders and pro-duction. duction up on the healthy figures generated in 1985 as the world's airlines moved into a period of extensive aircraft re-

The benefits of this boom, however, are spread very thinly in terms of airline manufac-turers and are concentrated on the two big US companies which remain in large-scale manufacturing—Boeing and McDonnell Douglas Between them, these two companies announced a propeller-driven aircraft to its total of 507 airliner orders last present range.

\$5660 last year.
That figure looks set to be easily excelled this year, when the group achieved net income of \$517m in the first six months against \$246m in the same paried of last year.

Victor.

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AEROSPACE manufacturing in capital commitments and tight directly has become increasingly managerial controls, have a simed at mounting a concerted sures on margins—a point attack on Boeing's pre-eminent polarised in the past decade or forced most of Boeing's early attack on Boeing's pre-eminent which was evident in the first-companies which still have a Eyen McDonnell Douglas has Boeing itself, despite its be big military suppliers.

Beging itself, despite its be big military suppliers and tight distributions of the big military suppliers.

rivals out of the business.

Even McDonnell Douglas has only a limited range to offeressentially the MD-80 twinessined 150-seater — leaving Boeing as the only producer in the world offering a variety of

An outstanding year is expected for airliner production but defence orders are now falling

products from the 100-seater 737 to the Jumbo 747, capable of taking up to 550 passengers.

Bosing recently added to its potential range by acquiring De Havilland, the Canadian mann-facturer of short taken of and a contract to the contrac facturer of short take-off and landing and other commuter aircraft, a deal which will add a number of short-haul,

year.

Some analysis now questions whether McDonnell Douglas swings of commercial airliner production are amply illustrated in Boeing's financial performance over the last five years.

The Seattle based group plummeted from peak earnings of \$600m in 1980 to a low of \$292m in 1982, and back up to \$566m last year.

That figure looks set to be easily excelled this year, when and has been diversifying recently with acquisitions in the information systems sector.

studios.

A Japanese group has recently signed a contract to take part in the development of the 7J7, Boeing's planned new 150-seater prop-fan aircraft, which could cost up to \$3bn to bring to production.

In the defence sector, the aerospace companies are now unquestionably moving into a period of declining orders after the exceptional boom that started with the defence building in the later years of President Carter's administration and that was given a fauthor. defence budget has been trimmed from \$314bn to \$296bn in 1985, and Congress

against \$246m in the same period of last year.

These sharp variations in earnings, along with the economies of large-scale production, which demand hefty get together with the European sector. Seems tageraline to support a further decline in authorised its larger rival would be through joint ventures, and there have been strong suggestions that the company might since defence spending is still considerably higher than a few

Additionally, several of these companies are having to trim back prices because of the Pentagon's recent accusations of inflated billing on some con-

of inflated billing on some con-tracts, and they stand to lose from the proposed new tax Bill going through Congress.

The rundown of military con-tracts may be one of the reasons why several companies appear intent on diversifying either outside or inside the defence sector. McDonnell either outside or insude the defence sector. McDonnell Douglas, for example, bought Hughes Helicopter two years ago; and General Dynamics, having swallowed Chrysler's tank business in 1982, acquired Cessna, the light aircraft manufacturer, last year,

More recently, Lockheed, which in the last decade has turned itself from a civil aircraft group into a pure defence and space company has acquired Sanders Associates, a high-technology electronic warware company. Analysts believe this will allow Lockheed to build up a military electronics business that will enable it to offer complete weapons systems to the Pentagon.

The third main sector of US aircraft manufacturing general aviation — has been in decline since the 1982 recession and seems stuck in the dold-rums for the time being. These small and executive aircraft manufacturers have suffered from the cutbacks in corporate seems determined to support a overhead spending, while their own costs have been hit by increased insurance premiums against product liability.

This will not spell poverty for the military contractors since defence spending is still considerably higher than a few



Final assembly line of the Boeing 757 twin-engined short to medium haul jet airliner at the company's Renton, Seattle, factory

Gulfstream, Cessna and Piper financial downswing. But signi-— delivered just over 2,000 ficant questions have emerged aircraft, the lowest figure in over the future of Gates Lear-40 years, and in the first four jet and Fairchild, both of manths of this year they sufmonths of this year they suf-fered further setbacks.

The value of orders in this period fell by almost 50 per cent from the 1985 figure, while deliveries were down more than 30 per cent, according to Wall Street estimates.

Several of these companies are owned by larger corpora-tions capable of absorbing the LEFT: The Lockheed-California Company's P-3 Orion modified for Airborne Early Warning and Control (AWACS) missions has been offered to the UK Ministry of Defence as an alternative

to the Nimrod programme. The P-3 is currently operated as a maritime patrol aircraft by 10

nations including the US. Right: The Pitts series of single-seat hiplanes, built by Christen Industries of Wyoming, has been used extensively for aerobatics for some years. The picture shows a Pitts S-2S as used by the British team in the recent Volkswagen World Aerobatics Championships

in the UK.

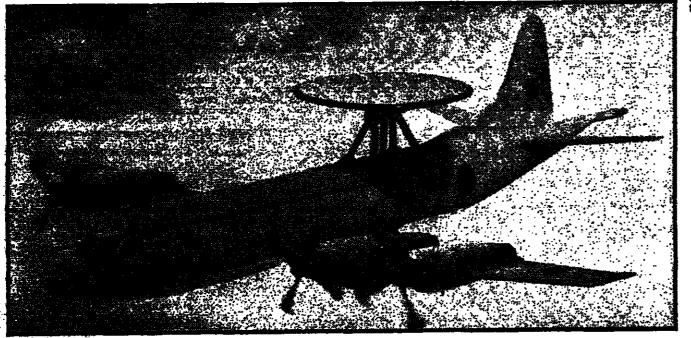
Fairchild's problems led it to withdraw from a joint airliner withdraw from a joint aringer development programme with Saab-Scania of Sweden earlier this year, and it is now pinning its hopes on the T-46 trainer that it is developing for the Government, but which has not yet received final approval.

Gates Learlet has suffered try, accounting for \$18.8bn of particularly heavily from the overseas sales in 1985, against collapse of the executive jet only \$5.6bn of imports. market, and is now diversifying as a contractor to the space pro-

gramme and the military.

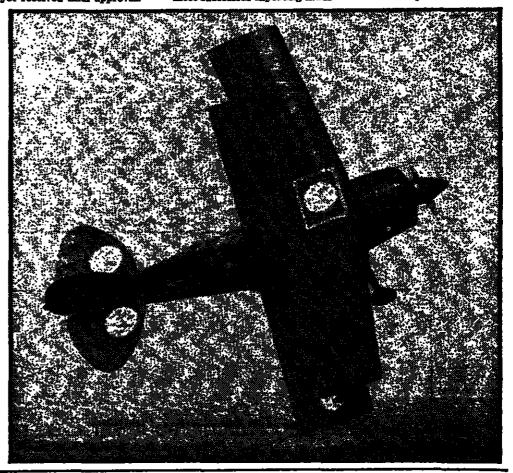
Although the troubles of general aviation are not excepcted to go away soon and the military business is not quite what it has been, the US aerospace sector continues to be one of the bright spots in the economy. It is the country's most successful exporting indus-

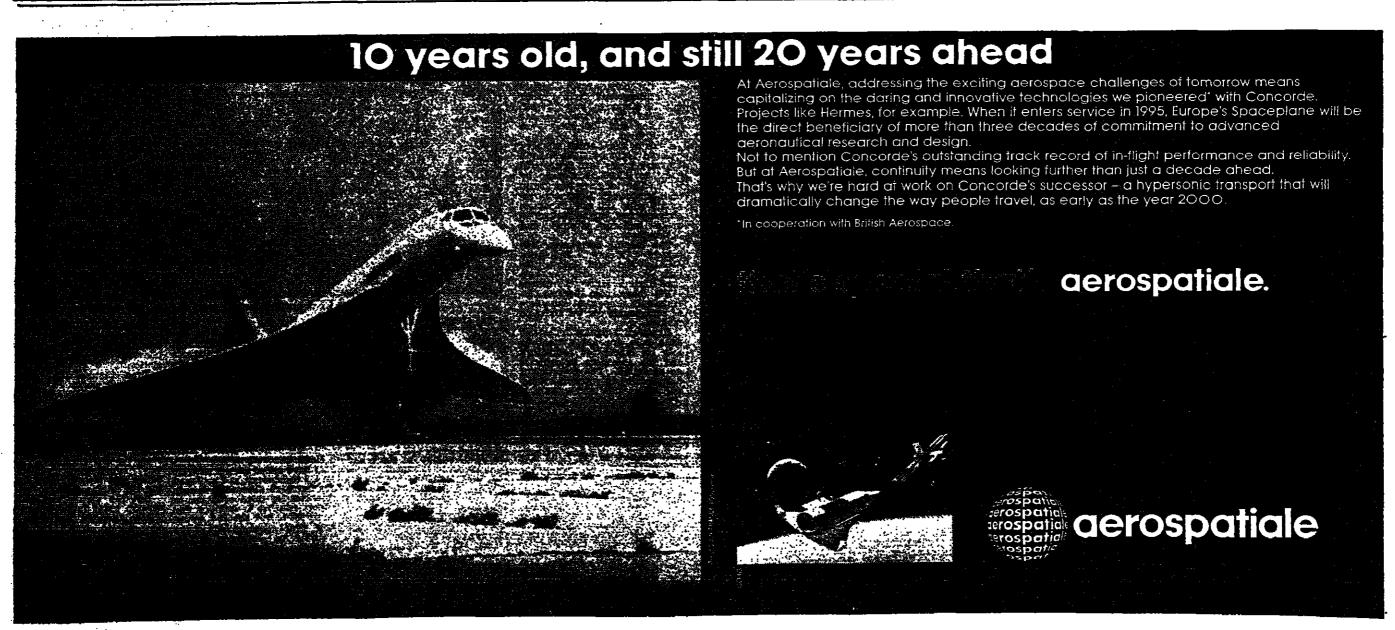
Total sales are now approaching \$100bn, and in recent years

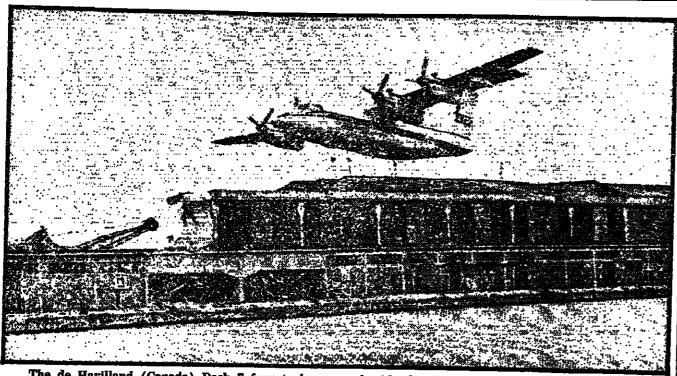


US aerospace companies—1985 results

1.5 1.5	McDonnell Dougl Lockbood Northrop		1985 sales (3m) 13,636.0 11,477.7 9,535.0 5,056.0 3,098.9	1984 miles (\$m) 11,129.0 9,662.6 8,113.0 3,687.8 2,603.6							5.1	
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The de Havilland (Canada) Dash 7 four turbo-prop, short-haul and short take-off/landing airliner

Canada

Continuing role for public purse

THE FEDERAL government's versy has died down as order invested. Because the light-privatisation programme is re-backlogs for the twin-engined twin helicopter market has resplaint important parts of Dash-8 have risen and Boeing Canada's aerospace industry, has moved to speed up develoption. Canada is moving production.

The industry comprises more tive aircraft. The industry comprises more than 100 companies, some subsidiaries of international concerns, grouped together in the Aerospace Industries Association of Canada. Sales will be the Quebec-based manufacturer and the Canadian-engined twin 400 series for commuter aircraft. It maintains Canada's second-which will use large amounts along the Canada. Sales will be the Quebec-based manufacturer the Quebec-based manufacturer.

The first Jetrangers and Toronto.

The industry is roughly diversely and the Canadian-engined twin 400 series for commuter aircraft. The first Jetrangers and Toronto. Aerospace Industries Association of Canada. Sales will be about \$4.5bn in 1986, about 80 per cent for export, and employment more than 46,000. Gradually, these companies are consortium from West Germany to a proper series of the consortium from the consort becoming more reliant on in defence orders, especially from Int

The Progressive Conserva- a valuable contract for the tives came to power late in 1984 maintenance of Canada's F-18 and inherited the problems of two airframe companies. Canadair in Montreal and De Havilland Canada in Toronto. popularity in Quebec though it Roth had been taken over by Ottawa to save them from collapse during the 1982-83

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but the role of the public purse ment of the stretched Dash-8 will continue to be vital for the to carry more than 50 passengers-creating a more competi-

in partnership with Montreal

Whether Canadair would get fighters is not clear, but the choice of Bombardier would help the government's sagging may peeve some other parts of the country.
Whoever wins Canadair will

recession.

In effect, Ottawa assumed nearly C\$2bn in development lenger in the medium term, costs for Canadair's Challenger executive jet, then having teething problems and for wall remains the market for high-perference inter-continental jets will remain and for wall remains and executive jet, then having formance inter-continental jets teething problems, and for will remain volatile, and competition from the US and

tron Canada is moving produc-tion of two series of commer-Worth to Montreal, while it continues development work on the Canadian-engined twin 400

Longrangers will move out the plant early next year, and it may yet have a role in the placement programme for the coastguard,

Both the federal and Quebec governments will continue to make support payments to com-plete the Mirable plant, in parallel with Bell Textron (Canada), but defence orders will be important for its long-

smaller helicopter plant in Ontario, owned by the West German-controlled MBB Aerospace Canada, and begun after Mirable, is already in produc-tion, handling a C\$23m federal contract.

Broadly, the industry, from muter aircraft.

The new government decided to take the privatisation route. First it moved to sell DHC to Boeing in preference to a Canadian consortium. Initial contrology where C\$250m has already been Broadly, the industry, from airframes to engines and avionics, has made a remarkable comeback from the recession. Its products are broader and productivity is higher. The biggest single unit, Pratt and

ing.

The company is shifting pro
company is shifting procial light helicopters from Fort duction of its small fanjet Worth to Montreal, while it engines to Toronto to make

The industry is roughly divided with half in Quebec and the Maritimes and half in Ontario and the West. McDonnell Douglas Canada in Ontario is busy making wings and other parts for the parent's successful MD800 series, and a host of parts and materials suppliers, engineered products, avionics and electronics producers are gearing up for better times.

The low-level air defence system contract, the Sea King replacement and Canada's space station programme will pro-vide several billion dollars of underpinning in the medium-term. But one conspicuous suc-cess is the CAE Electronics division of CAE Industries, which has carved itself an en-viable niche as one of the world's three makers of simu-lator equipment for commer-cial airlines and military use.

Robert Gibbens

Soviet Union

Designs match best in the West

and scope the erospace industry Soviet aerospace US, across the whole spectrum US, across the whole spectrum of civil and military aircraft and engines, guided weapons and spacecraft, as well as in avionics and related industries. Hanover and Paris, pour out insorting the specially on civil aircraft. Detailed information

hard to obtain but it may even exceed the US aerospace industry's output in military combat aircraft, reflecting the greater proportion of Soviet gross national product devoted to military production of all kinds.

This is suggested by statistics repared by the US Department of Defence, comparing aircraft turn production in the Soviet Union Wi and Nato countries. They show that in 1984 the Soviet Union produced some 900 fighters and hter-bombers, against Nato's 525; 300 transport aircraft, against Nato's 250; and some 300 helicopters, against Nato's

The total of Warsaw Pact military aircraft is nearly 13,000, compared with Nato's 11,000; while the number of Warsaw Pact combat aircraft in place in Europe exceeds that of Nato by a substantial margin.

Nor is this advantage in numbers due in any way to lower quality in a bid for quantity. Many current Soviet. quantity. Many current Soviet civil and military aircraft designs, as seen at recent Western air displays, are of a high standard of technical

This is a radical change from the position some years ago when undeniably, the manufac-turing finish on some Soviet aircraft shown in the West was inferior to that of the US and UK aerospace industries. Clearly, the Soviet Union has paid considerable attention no quality and operational perfor-mance, and today its designs match the best available in the

This is probably due to two factors: first, the substantial amount of money devoted to defence production in the Soviet Union, and particularly to military aircraft; and second, the massive of the ma the massive efforts made to acquire modern Western technology.

In many cases, this is not difficult. Freedom of informa-

clearly matches that of the about civil and military aircraft

craft, in a manner unknown in the Soviet Union.

While so-called "missions," come to those air shows, and major new Soviet aircraft are occasionally displayed as pub-licity exercises, the primary purpose is to gather as much inpurpose is to gather as much in-formation as possible about what is going on in Western aerospace, while offering the minimum information in re-

Where information cannot be obtained in such an open manner, the Soviet Union does not hesitate to use other techniques. The US government, in its most recent analysis, Soviet Military Power, states:
"Through both legal and illegal acquisition of modern western production techniques, the Soviets are establishing more efficient, integrated and technologically advanced capabilities for the production of highly sophisticated weapons,"

The same document says that, "throughout the last decade, the Soviet military has absorbed an increasing share of the nation's gross national product, a share now estimated at 15 to 17 per cent." This compares with about 6.7 with about 6-7 per cent for the

The sustained Soviet economic commitment to the military is further revealed by the flow of resources to, and growth of, the machinery industry. This key sector of the economy, broadly divided into military and civilian machinery production, is the source of the Soviet Union's military weapons, civilian investment goods and consumer durables. The machinery sector continues to experience the most rapid growth in the economy: in 1984, when overall industrial growth was 4 per cent, the machinery sector expanded by some 7 per cent," says Soviet Military

cent," says power.

Power.

"The military machinery proportion of this sector now accounts for 60 per cent of total machinery output, and has been receiving nearly all the additions to the machinery sector's

Whatever the Soviet methods of acquiring information, the fact remains that the output of its aerospace industry is formidable, in quality as well as

midable, in quality as well as quantity. This applies as much to space hardware as it does to civil and military aircraft, engines and guided weapons.

The structure of the industry is different from the industry as the

minimum.

These aircraft bureaux, in alphabetical order, are:
Antoney, based at Kley, was founded by the late Oleg Antonoy. It is primarily a builder of transport aircraft for civil and military purposes. Some are unique in design, such as the An-72 twin-jet short take-off and landing transport, with engines mounted on top of wings that are set high on the fuselage. The latest Antonoy product is the An-124 Condor, a strategic heavy transport that a strategic heavy transport that is the heaviest transport aircraft in the world, and which is expected to be seen at Farn-

borough. Beriev, founded by the late Georgi Beriev, and based at Taganrog, is primarily a pro-ducer of amphibious aircraft. Hyushin, founded by the late Savoal Tunshin is also mainly Sergel Hyushin, is also mainly a transport aircraft builder. Its most famous recent products in-clude the IL-86 four-jet wide-bodied transport, of which a longer-range derivative, the II-96 is under development.

Kamev, originated by the late Nikolai Kamov, is primarily a helicopter producer.
MiG, the famous fighter-producer, was founded by the late Artem Mikoyan and Mikhall Gurevich. Its latest product seen in the west is the MiG-29 Fulcrum fighter. Fulcrum fighter.
Mil, founded by the late
Mikhail Mil, is also a helicopter
hut is engaged in

producer, but is engaged in bigger, heavier ones than Kamov. They include some of

tion in the West means that labour force, leaving little or the biggest in the world, such enormous quantities of data no labour growth for the as the Mi-26 eight-bladed rotor about civil and military aircraft civilian sector."

a limited output which includes the big four-let strategic bom-ber, tanker and reconnaissance

Sukhoi, named after Pavel Sukhoi, is a major fighter builder, whose latest venture is

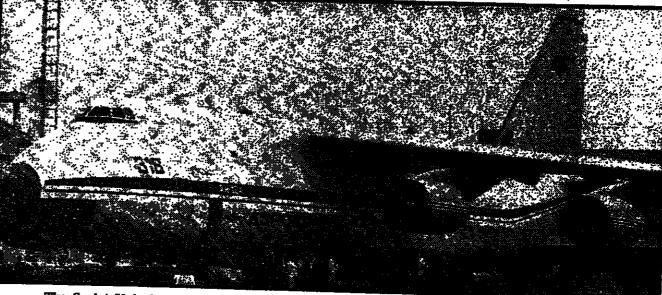
The structure of the industry is different from that of the West, where many individual companies, either state-owned or private, compete for major orders. In the Soviet Union, the industry consists of a number of major "design bureaux." most of which were established by famous designers whose names are perpetuated in the organisations, and which specialise in particular types of aircraft. Competition is kept to a minimum.

Sukhoi, is a major fighter the Su-27 Flanker counters in t is more securely built on such major airliners as the Tu-154 tri-jet, and on such bombers as

Yakovlev was founded by Alexander Yakovlev, who still runs it. Its versatility has produced such aircraft as transports (the Yak-42 tri-jet Clobber airliner); combat types, like the Yak-38 vertical take-off ship-borne fighter (Forger A); and light aerobatic and sporting aircraft.

Soviet aero-engine capability is also substantial, with such major bureaux as Isotov, Ivchenko, Kuznetsov, Lotarev and Soloviev (although there are others) meeting the entire needs of the aerospace industry. What is significant about these manufacturers is that they are all substantially self-contained. Unlike the West, where there is a major and growing international trade in aircraft parts and engine equipment, and even in manufacturing collaboration, the Soviet Union buys little from outside, although some procurement from the West is not unknown. This is partly due, however, to the western strategic arms embargo on trade in sensitive tech-noligical items to the Soviet Union; although, as already mentioned, the Soviet Union conducts a considerable clan-dering bysiness (in sensitive clandestine business in acquiring western technological know-how.

Michael Donne



The Soviet Union's Antonev An-124 Condor, the heaviest aircraft now flying in the world

Japan

Strong bid for self-sufficiency

JAPAN IS not yet known world-wide for its aerospace industry, but it soon will be. The country makes several types of military and civil aircraft and is about to become self-sufficient in communications satellites and the rockets in

launch them.

Sales of the aircraft industry reached Y500bn in 1984 and the reacted 13000n in 1964 and the industry hopes that figure will grow to Y2,000bu a year by 2000. The industry has grown mainly through Ecence agreements with US and European airframe and engine makers to make military signafer and make military aircraft and

elicopters.
The leading companies, Mitsubishi Heavy Industries (MHI), Kawasaki Heavy Industries (KHI) and Ishikawa-jima-Harima Heavy Industries (IHI) have also become increasing in the control of the control o creasingly important suppliers of components for US airframe However, Japanese industries

as a rule are not content to rely on others for technology and the aerospace industry is no exception. The no exception. The government has generously supported inno-vation in this sector and is likely to extinct

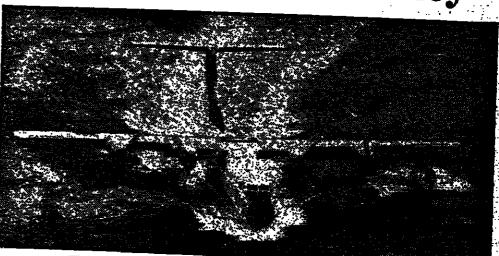
vation in this sector and is likely to continue to do so.

Japan's most novel aircraft project to date has been the Y29bn Asuka fan jet short take-off and landing (Stol) commercial aircraft. The development was started in 1977 by the National Aerospace Laboratory of the Science and Technology Agency, and the aircraft, built by KHI, had its maiden flight last October.

Agency, and the aircraft, built by KHI, had its maiden flight last October.

Though its total weight is 39 tonnea, the Asuka can take off and land on a 700-metre runway. The main innovation is the installation of the engines above the wing to generate lifting power two or three times that of conventional jet aircraft. The result is that the Asuka can land or take off at only 130 kph.

The Asuka is strictly a re-



The Shin Meiwa US-1 amphibious search and rescue aircraft

search aircraft, but the agency hopes it will lead to commercial development within three years or so. RHI is also the lead contractor for the totally indigenous T-4 jet trainer. More than 200 are to be manufactured for the Defence Agency this year following successful test flights last year.

On the engine side, the main project is the International Aero Engine (IAE) consortium set up six years ago to develop the V2500 engine for short- and medium-range aircraft. Three Japanese companies are partici-pating. Tests on the first ex-

into synchronous earth orbit.

Until now, all Japanese rockets have relied almost entirely on US technology, and so Japan has not been allowed to launch satellites for third countries or export satellite technology and equipment. But the H-2 rocket now under development relies entirely on Japanese technology and is intended to put a 2,000 kg payload into synchronous orbit by 1931.

Despite the recent problems

Despite the recent problems in the US and European space programmes, Japan is pushing ahead with its programme to build a pressuries.

The first 100 per cent Japanesse satellite is due to be launched in 1991. Significantly, it will be launched in Japan's first entirely home-made large rocket.

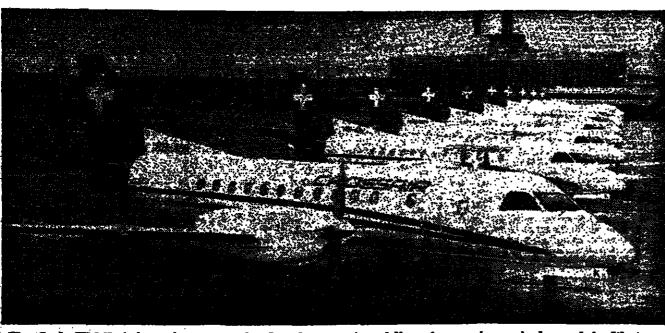
Japan's space agency has long rocket experience going back to 1975 when it launched the small N-1 rocket. This month it was due to launch its H-1 rocket, which is powerful enough to put a 550 kg payload into synchronous earth orbit.

Until now, all Japanese rocso expects Japan to buy American rather than try in catch in-Last month Mr Malcolm Bald

Last month Mr. Malcoim Baldrige, the US Commerce Secretary, complained again that Japan was trying to avoid buying US satellites.

But the main focus of this tension today is the Japan Pefence Agency's desite by buy new fighter aircraft to replace its ageing facet of 70 Missionishi F-1s. The industrial agablishment is pushing hard for a lishment is pushing hard for a decision in favour of the FSL under development by Mill, but the US wants Japan to but F-16s or F-18s.





The Saab SF-340 twin turbo-prop regional and commuter airliner is now increasingly used in Western Europe, the US and elsewhere, This line-up of 10 SF-340s shows the Crossair, Switzerland, fleet

Sweden

Shift to civil aircraft building

dustry is continuing to shift the facilities necessary to complete emphasis from military to civil aircraft production, but the project. The new invest-aircraft production, but the ment puts increased financial past year has proved that such a transition is not always asset a transition is not always easy. Sion, which saw its net income the centrepiece of SAAB. Scania's expansion into the civil of SKr 192bn in 1984 to SKr sector is the SF-340, a 35-seat 1985 due to the start-up costs craft, built in collaboration with Fairchild Industries of the US, Work on the inint vertex.

the Swedish Air Force at a time of rising military R&D and production costs, and constricted defence spending.
When the SF-340 went into production in 1984, it also conveniently covered a hull between the company's production phase-out of the Viggen aghter in the mid-1980s and start-up of the multi-purpose JAS 39 Gripen cominal alternit in the

burden of manufacturing the aircraft on its con. As a result, sale has had to invest an additional SKr 500m, raising its involvement in several additional SKr 20m. Although Fairchild paid SAAB \$20m when it dropped earlier this year to participate in the project, this only in the research phase of the motive group, and GE are company as feel motive group
Work on the joint venture began in 1979 when SAAB saw it was becoming dangerously over-dependent on orders from SF-340. The break-even point, previously estimated at 200 aircraft, is now said to be at least

This is a daunting figure considering that it represents 20 to 35 per cent of the world market for commuter aircraft and that SAAB must compete of the decade when more than against the De Haviland Dash 8 80 per cent of its sales were and Embraer's Brasilia 120.

SAAB has deliment the De Haviland Dash 8 80 per cent of its sales were military-related. SAAB has delivered 61 SF340s

construction of a new wing prop-fan programme.

Boeing 7J7 prop-fan airliner and will provide airframe parts, smounting to a 4 per cent interest in the project. However, its planned particl-pation in production of the

McDonnell Douglas MD-11, for which it was expected to make the tail fin, is now uncertain following the Swedish government's refusal to provide a SKr 400m loan to cover invest-

With the SF-340 in full production and the company sup-plying airframe components for the MD-80 and the BAe 146, SAAB's business is now evenly balanced between the military and civilian sectors, the goal it

But SAAB's—and Sweden's—single biggest aerospace programme remains the JAS 39, the first flight of which is scheduled for next year. The Gripen commind aircraft in the small firm orders take the total single biggest aerospace proto 90. Those in service have appeared last Rovember when appeared last Rovember when Fairchild withdrew from the project, citing economic reasons leaving SAAB with the burden of mammaterizing the surgest to its own As a result represent to its own As a result represent to the same and sweeth service have single biggest aerospace proto 90. Those in service have gramme remains the JAS 39, the first flight of which is scheduled for next year. The SKR 40bn project calls for 140 aircraft to be produced for the Swedish air force by the end of the century. SAAB is responsible for 60 per cent of Swedish air force by the end of the century. SAAB is responsible for 60 per cent of

partially covers the cost for McDonnell Douglas MD-91X producing the single jet engine

It has also joined the team Ericsson is producing the radar, of companies working on the sensor and target acquisition display.

The programme was threatened last year by a cost overrun due to dollar-denominated foreign contracting, which includes GE, Lear Siegler (electrical flight systems) and British Aerospace (development of an all-composite wing). But the steady fall of the dollar against the krona this year has bridged the budget gap temporarily at

SAAB is pinning export hopes on the JAS 39 despite the fact that it has not successfully sold any combat aircraft abroad since the 20-year-old Draken. SAAB believes that the JAS 39's combined role as a fighter, ground attack and reconnaissance aircraft together with its easy maintenance— simple enough to be performed by conscripts—will make it ideal for smaller countries.

volvo Flygmotor has also been increasingly shifting its attention to the civil sector, which now accounts for 40 per cent of sales. It is cooperating with GE, Pratt and Whitney and Garrett on a range of

SAAB's space subsidiary was the project's prime contractor.

Sweden's next space project tions and broadcast satellite scheduled for launch in 1987. SAAB is a subcontractor in the SKr 1.5bn programm with the prime contractor being France's Aerospatiale. Sweden is financing 80 per cent of the Tele-X budget with the rest shared by Norway, Finland and possibly Denmark.

Sweden is also planning to spend SKr 1bn, divided 60/40 between industry and govern-ment, on European Space Agency-related activities by 1990, including the Arlane Launcher, the Hermes Space Shuttle and Columbus space

John Burton

France

Hard choices on collaboration

THE FRENCH aerospace industry is approaching a cross-roads in the sky. The sector, which has long been one of the most dynamic and internationally successful areas of French industry, faces a number of difficult decisions over foreign collaborative projects which could spell make or break for the 1990s.

the 1990s.

The industry has managed up to now to balance the alternative challenges of competition and collaboration with a reason-

able degree of success,
Aerospatiale, the state-owned
aerospace group, has become a
pillar of European collaboration. It has forged strong links with Messerschmitt-Boelkow-Blohm of West Germany and with British Aerospace over projects as diverse as the European Airbus and anti-tank missiles. The longer-standing contact with MBB—which go back to the birth of post-war Franco-German aerospace and arms co-operation, at the end of the 1950s, are underlined by

On the other hand, Dassault-Breguet, the military aircraft maker in which Mr Marcel Dassault, its founder, never loosened control up to his death in April, has provided a counter-company by foreign a wait, language

path,
The Dassault Mirages throughout the 1960s and the 1970s be-came symbols and sometimes even promotional tools of France's independent foreign

example by forging a go-it-alone

Now, however, faced with increasingly aggressive American competition on world aerospace and defence technology markets, and shrinking budgets among some of France's traditional clients in the Third World, Dassault clearly is having to change course. Two events illustrate the in-

creasing pressures faced by the French industry. The presence of Chancellor Helmut Kohl at

be trying to take a much larger share of the cake in future

The other event was Dassault's offer at the Jakarta air show a few weeks ago to help construct a mooted fighter to be built by the fledgling Indonesian aerospace industry. The idea of Dassault offering its services as a sub-contractor would have been unthinkable even a few months ago," says a top executive at another big French aerospace group.

Dassault's stubborn refusal to

1990s, as well as wrangling over the two new Airbus projects— the A330 and A340 — curthe idea, put forward by Presirently on the drawing board.

The other event was that France could take a small Dassault's offer at the Jakarta stake in the four-nation fighter air show a few weeks ago to to be built by Britain. West

give up its claim to leadership in the long-running negotiations over the European fighter the Hanover air show in June aircraft last year now appears backed up the belief that the to many in the French industry

share of the cake in ruttre possible collaborative agreements with northern European countries including Belgium, Strong hints have already the Netherlands, Norway and Occurred in recent months as a Denmark, which could join in result of difficulties with the Franco-German project to build a joint attack helicopter for the made its maiden flight in July.

Germany, Italy and Spain.

This means that the Rafale follow on and the EFA will both be slugging it out on world markets in the 1990s—a prospect which adds to the possibility that Dassault will try to make the planned lighter. try to make the planned lighter version of the Rafale as attractive as possible for export

One intriguing idea being examined is that Dassault could go into partnership with a US company such as Northrop for work on a 1990s fighter. A strong example of US-French co-operation has already been set by links between Snecma and General Electric in the aero engine field.

As Paris and Bonn do their best for political reasons to keep tension between their two countries' aerospace industries under control, France might find some logic in seeking greater rapprochement with the US aerospace industry in coming years.

For instance, French officials strongly back Airbus Industrie's contacts with McDonnell Douglas over possible co-operationalthough they say there is no question of allowing any delays for the A330 and A340

Paul Betts

West Germany

Strategic ventures outside Europe

WEST GERMANY'S leading reconcern, Messer-schmitt-Bolkow-Blohm (MBB), spreading its wings in recent months, has embarked on two important in broadening the strategic ventures aimed at opening up important new recent measurements.

Technology, Mr Jusef Habible could be as many as 1,200 airfor the fuselage, Deutsche Airbus has said it is prepared to build other key sections, such important in broadening the as parts of the wing, helped by some 4,300 direct jobs, although a long-term repayable grant of Germany is participating in the key European space projects including the recently and the recent that the recent the function of the form the fuselage, Deutsche Airbus has said it is prepared to build other key sections, such and the recent that the recent

non-European markets. One big breakthrough came this spring at the Hannover International Air Show, where the group signed an agreement Republic of China to jointly develop a new 60-85 passenger

prop-fan regional airliner. Beyond China, Mr Hanns Arnt Vogels, MBB's chairman, says he envisages a "worldwide demand" for as many as 1,000 of the aircraft in the 1990s, not least from developing countries.
A final decision on the \$1bn project, expected early next year, will follow feasibility studies now going on at a joint

office in Hamburg. Another important deal was announced in Jakarta. MBB, together with Boeing of the US, has signed an agreement with Indonesian State Aerospace to develop an 85/90-seat commercial aircreft using monoton cial aircraft, using prop-fan technology, to be in full production in the early 1990s.

The potential market, accord-The potential market, accord- combining to Indonesia's Minister of \$2.5bn.

The latest venture planned by Europe's Airbus Industrie is to develop in parallel both the A-330 short-haul high-density twin-engined jet and the four-engined

long-range A-340, using common wings, fuselage and systems

has been operating largely in a European context. Like other German aerospace

companies, its expansion was cramped by post-war Allied restrictions which worked to the benefit of its British and

series of joint ventures The group is prime German contractor for both the European Airbus civil aircraft venture—in which it holds a 37.5 per cent stake—and the threenation Tornado military aircraft.

On both the civil and military side, new-generation aircraft are being developed for the next decade. Deutsche Airbus, the consortium's partner owned by MBB, is seeking to increase its overall participation in the two new civil projects, the short- to medium-range A-330 and the long-range 340, which have a combined development cost of

On the military side, producaged though to find a place in tion of the Tornado strike air-the international aerospace craft may stretch beyond the league by participating in a original 1989 date thanks to important export orders includ-ing some 100 fighters destined for Saudi Arabia. But another order, for 40 aircraft from Turkey, has apparently run

into a dispute over financing. The group's planned joint venture with France to build an anti-tank and combat helicopter has also been bedevilled by rows over equipment and specifications as well as rising

In the longer-term of course, lies the new European Fighter Aircraft or Eurofighter project, in which both MRB and Dornier are to participate as the German partners to Britain,

as parts of the wing, helped by a long-term repayable grant of some \$10n from Bonn.

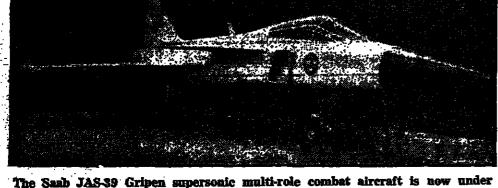
There are strong indications that Lufthansa, the state-owned airline, may emerge as the shuttle for the mid-1900.

While MBB remains the country's dominant aerospace incern it has been faced in the past year with a challenge in the form of a powerful new industrial concentration.

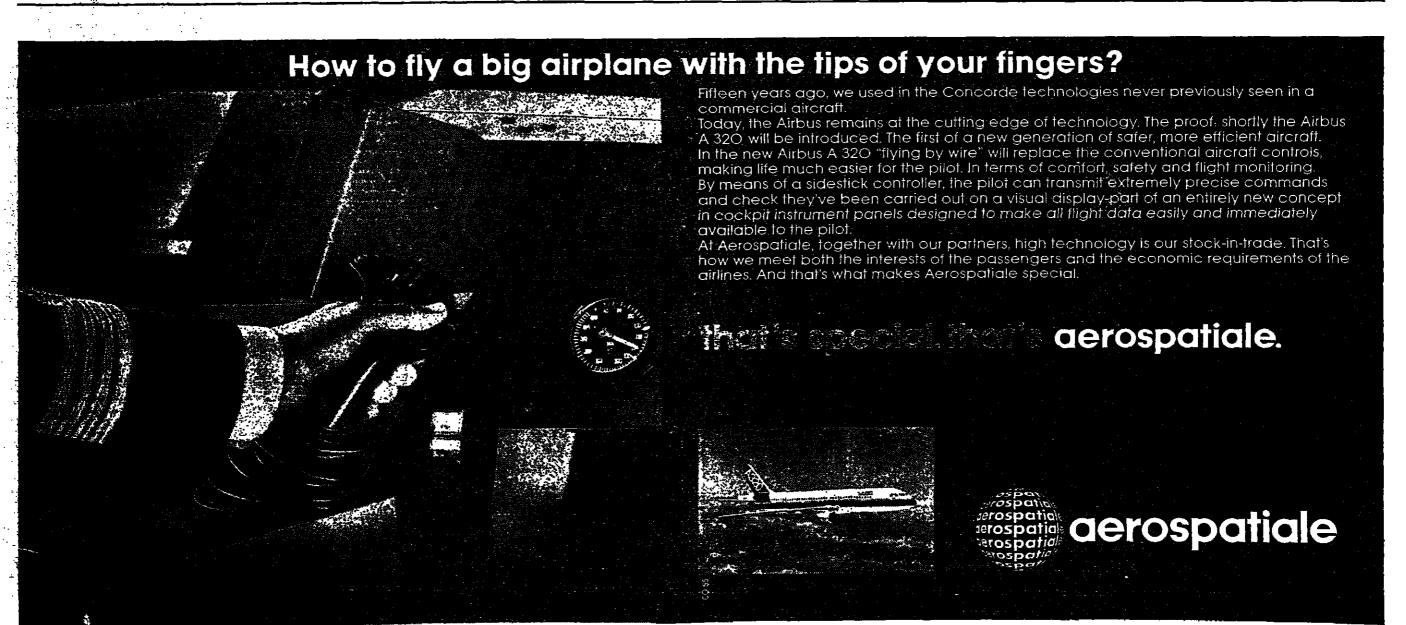
Daimler-Benz, the car. and truck builder which is one of the nation's biggest industrial concerns, last year took control first of Motoren-und-Turbinen-Union (MTU), which is the dominant sern-engines manufacturer, and then of Dornier, the then-family-owned aircraft producers.

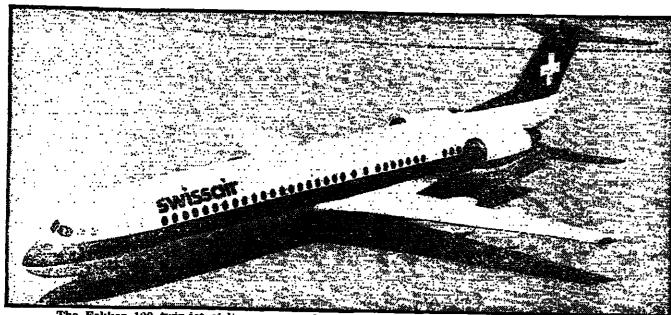
bined sales last year of DM 44bn Moreover, it has recently emerged that Dornier may be preparing to take a 20 per cent stake in Deutsche Air-bus from MBB, assuming the A330/340 project goes ahead.

David Brown



The Sanh JAS-39 Gripen supersonic multi-role combat aircraft is now under development in Sweden, and will make its maiden flight next year





The Fokker 100 twin-jet airliner, now under development, shown in the colours of Swissair, one of the major customers, with deliveries starting next year

Switzerland

Contracts agreed just in time

SWITZERLAND'S small zero Tucano despite, the Swiss claim, space industry, concentrated the RAF's preference for the within the Oerlikon-Bührle, PC-9.

The SFr 1bn (\$580m) order range and more accurately, and that Oerlikon's military products against surprise attack by division secured in April to armed helicopters. group, has experienced much re-lief this year with three important contracts being con-cluded in the nick of time. Two were for the Pilatus PC9 primary trainer and the third was a breakthrough order from Canada for Oerlikon's new Adats guided missile system. None contributed to the in-crease in net earnings in 1985 which persuaded Oerlikon-Bührle to resume dividend payments to shareholders after a two-year lapse, but they cer-tainly helped to set the mood in which the Board took its de-

Pilatus secured its contracts with Australia and Saudi
Arabia. The Australian order,
valued at A\$230m, is a licensing deal under which 67 PC-9s
will be built by Hawker de
Havilland of Sydney for the
Australian Air Force.

It entails work equivalent to

It entails work equivalent to

The PC-9 turbo-prop trainer was developed in collaboration with British Aerospace to bid for the RAF's order for a new primary trainer. It suffered a setback when Britain's Defence Ministry decided to award the contract to Brazil's Embraer the US.

Now that its future is secure for the next couple of years at least, Pilatus is planning new projects within the sector it has setback when Britain's Defence made its own, the highly vercontract to Brazil's Embraer utility aircraft.

However, Pilatus' co-operation with British Aerospace brought it into the massive deal under which Britain is to supply Saudi Arabia with 132 military air-craft. Pilatus will provide 30 PC-9s as the primary trainer in-volved in the deal alongside the

With several unpublicised smaller deals, Pilatus now has orders for nearly 130 PC-9s and is expanding the production line at Stans to be able to build 30 a year by 1987, when it should be turning a profit on its new trainer.

The PC-9's predecessor, the PC-7 basic trainer, is still in It entails work equivalent to manufacturing between 15 and 20 aircraft for the Pilatus plant at Stans, just outside Lucerne, where the production line is being expanded.

The PC-9 turbo-prop trainer was developed in collaboration with British Aerospace to bid for the RAF's order for a new least Pilatus is planning new least Pilatus is

ine dedicité

APPROACH.

It was the first contract for the Adats (air defence and anti-tank system) in developing

deal can unlock contracts with other Nato countries, among which Belgium, the Netherlands and Turkey have been mentioned. Adats is also being tested by the US army. To win the Canadian order Oerlikon formed a consortium with Litton Systems Canada and agreed to establish a company

in Canada to assemble Adats units in a plant to be built at St Jean-sur-Richelieu, Quebec. The company will aim at winning export contracts. The Adats was developed in

partnership with Martin Marietta Aerospace of the US. Oerlikon claims that it offers a technological leap ahead in providing ground defence against low-level strike aircraft, which have now acquired the ability to release weapons at greater

that Oerlikon's military products division secured in April to supply Canadian land and air forces in Europe with a low-level air defence system undoubtedly weighs heaviest in the doubtedly weighs heaviest in the systems, according to Oerlikon, Adats' main components are Adats' main components are a search and acquisition radar

volved in the deal alongside the 30 advanced Hawk jet trainers.

The value of the contract for the Swiss has not been disclosed but can be estimated at about SFr 110m (\$65m) and all 30 aircraft will be built in Switzerland.

anti-tank system) in developing which can handle up to 10 targets simultaneously from the more than SFr 500m and it was won in very tough competition with US and other manufacturers, among which Sweden's Bofors proved to be the closest.

Oerlikon has invested gets simultaneously from the more than SFr 500m and it was won in very tough competition with US and other manufacturers, among which Sweden's Bofors proved to be the closest.

Oerlikon has invested gets simultaneously from the more than SFr 500m and it was won in very tough competition with US and other manufacturers, among which Sweden's late of 6,000 metres and a range of 20 kilometres and electropotical module with a Flir (formatical contracts) in the contract of the contract for the sweden's surface up to an altitude of 6,000 metres and electropotic for the contract of the contract for the sweden's surface up to an altitude of 6,000 metres and electropotic for the contract of the con which can handle up to 10 tar-gets simultaneously from the and a carbon-dioxide laser for missile guidance and missiles with solid fuel boosters capable of accelerating them to a velocity of more than Mach 3 within three seconds.

A special characteristic is the defence against jamming. Neither of the two sen ers in the electro-optical module are affected by any known jammers and the proximity fuse on the missile is immune to jamming or deception by any currently-known electronic counter mea-

sures, Oerlikon says.

The Adats is a modular system which in its basic form, equipped with eight missiles and a three-man crew, weighs barely four tonnes and can be fitted to light tracked or wheeled vehicles.

Whether moving about in

space or attempting to

track aircraft from the

ground, modern man

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ronics for government

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has acquired a unique

experience has permit-

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these users. Thomson-CSF is continuously improving its airborne

experience which is now put to use on all five continents. This

William Dullforce

Spain

Combat aircraft of great importance

pany, signalled that its future could be faced with a mixture of hope and confidence. Mr Fernando de Caralt, Casa's chairman, talks of the company being at "a half way stage" and on "a frontier line."

Mr Caralt's frontier marks the division that a medium-sized European national company may face between "just getting by," as he puts it, and "being well and truly solid."

By 1990, Mr Caralt claims, Casa will have crossed the Rubicon. He expects, four years from now, to have doubled the company's income to Ptas 100bn. The 1985 results were upbeat and gave substance to such targets. After dipping into Pta 270m losses the previous year, Casa returned pre-tax profits in 1985 of Ptas 1.6bn, the highest

annual profit in the company's Total income was Pta 47.8bn against Pta 42.6bn in 1984 and orders at the end of the year were up 30 per cent to total Pta 77.8bn. Cashflow in 1985 stood at Ptas 2.8bn, up from Pta 1.1bn the previous year.

What Mr Caralt stresses about present state of health is these

present state of health is that the company hired more than 200 new engineers during 1985.

It is not surprising therefore that he terms a project to build from scratch a combat aircraft for the Spanish Air Force "of capital importance to our future."

The new aircraft, codenamed the AX, is presently at the design stage. It is intended to replace the Air Force's F-5s and it will be the result of the growing technology that Casa has acquired.

Casa is particularly proud of Casa is particularly proud of the carbon fibre expertise developed by its research department. The Spanish company has taken advantage of spin-off deals that followed Spain's purchase of 72 F-18A Tomcats, built by McDonnell Douglas, to supply directly the flaps, fuse-lage side panels and stabilisers of the US combat aircraft.

of the US combat aircraft.

The stabiliser technology is now being put to use in the Airbus projects in which Casa has a 4.2 per cent stake, and carbon fibre will be also applied, Casa expects, to the Eurofighter project in which the Spanish company has a 13 per cent stake.

IN ITS report to shareholders "I need more grey matter and this year Construcciones Aeronautics S.A., Casa, the Spanish public-controlled aerospace company, signalled that its future could be faced with a mixture of hope and confidence Mr. Force has deployed in Europe.

A further development is the diversification into missiles, thanks to the Spanish Government's purchase of 500 Roland missiles from the French-West German Euromissile consortium. Under the terms of the purchase, Casa is to be involved in the manufacture of a further 6,000 Roland warheads for ex-

The Spanish aerospace company will be building on this technology transfer to develop a wholly Spanish programme for portable surface-to-air, 2,000-3,000-metre range, missiles for the Spanish Defence Ministry Ministry

Meanwhile, Casa's C-212 Aviocar, better known as the Jeep with wings, has been a consis-tently good product: sturdy, versatile and competitive in the short-take-off-and-landing

A total of 22 Aviocars were sold in 1985 and a further 14 were sold in kit form. Orders continue to come in and at the latest count there are 390 C-212s flying in 35 countries.

The Jeep with wings gave a new twist to its versatility this

known as the C-101, which has an updated C-101-5 version, received a fillip this year with the purchase of 16 aircraft by the Jordanian Air Force. Case

up this deal, a breakthrough for the company in the Middle East, with further sales to Arab nations. The C-101 is primarily used by the Spanish Air Force and has also been sold in Latin

executives are anxious to follow.

America. However, the chief interest at present centres on the new product, the CN-235, which is hi-motor commuter blane that has been developed jointly by the Spanish company and by P. T. Nurtanio of Indonesia. More than 111 CN-235s have been ordered, mostly through

the Indonesian sales operation.
The first units of the aircraft, which was rolled out in 1983, are scheduled to be delivered in November. The first client is Saudi Arabia.

Cass hopes that there will soon be firm orders for the sleek, 40-plus passenger plane on its home ground as Spain's regional, inter-city airlines are built up.

Tom Burns

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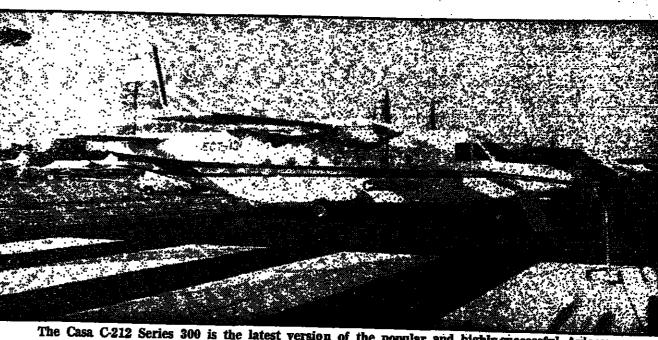
Jan Charles

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8

PERS AVIA



The Casa C-212 Series 300 is the latest version of the popular and highly-successful Aviocar, built jointly by Casa and Nurtanio of Indonesia

need to join development

would be lost without AS A SMALL country Belgium the aid of electronics. has always stressed the virtues has always stressed the virtues of international co-operation. But while its principal role as sub-contractor to other people's aerospace projects has brought participation in major programmes such as the F-16 fighter, the European Arbus, and the Ariane space vehicle, dependence on the outside world leaves its manuface. Right from the beginning of aeronautics, the men who founded Thomson-CSF have taken part in the great adventure of aeronautics, designing aviation radiocommunications equipment. side world leaves its manufac-turers inherently vulnerable in Thomson-CSF is the leading French com-

a downturn.
There is, nevertheless, a growing awareness of the need to enter new programmes at the enter new programmes at the development stage, rather than simply buying in an aircraft designed and developed else-where and assembling the parts

under licence. Since the Second World War, Belgium's aerospace industry, which is based in the southern which is based in the southern Walloonia region, has relied on "compensations" — work subcontracted back to Belgian manufacturers as a quid proquo for government orders placed on behalf of the Air

with General Dynamics of the US for 44 additional F-16s was a case in point, the American company agreeing to place about

Local industry is already looking for clues as to how the Air Force will ultimately replace these F-168—it has about 120 in all—and the So 120 in all—and the 80 or so Mirage jets, when the need arises some time in the 1990s. Belgian aerospace — the Big Three (BFrs) employees 1979 19 1979 1985

3.17bn 2.57hn 1,860 space Sonaca 1.87bm 2.63bn (Fabrique Nationale) 3.21bn 9.65bn Source: European It is well known, for example, that discussions have been held

that discussions have been held this year with both Dassault and British Aerospace, with a view to joining either the French Rafale project or the new Euro-pean Fighter aircraft (EFA) consortium of Britain, Germany, Italy and Spein, Observers feel that collabora-

Last year's BFr 50bn contract with General Dynamics of the US for 44 additional F-16s was a case in point, the American company agreeing to place about 80 per cent of the business back in Relegium.

1,578 1,831 There are a number of possi-bilities. Sikorsky, for example, has suggested that it could build

a new factory if the order went

a new factory if the order went its way—but despite speculation over the last four years the current public spending climate seems likely to delay the project again—perhaps beyond 1987. There are three major com-nantes in the Relgian agreement Observers feel that collaboration with the French is still the more probable—a stake in the Rafale project would almost certainly be less expensive than the EFA option (and thus attractive to a Government seeking at every corner to trim the budget) while the French fighter is thought to be more suitable for meeting Belgium's Nato commitments. Although

Nato commitments. Although early days, the discussions are a measure of the country's feedness to participate in new programmes at an early stage.

The other beacon of hope for an industry which lives primarily off defence orders is primarily off defence orders is the need to replace the armed forces' ageing helicopter fleet.

Besides the F-16 work — Sonaca for instance is responsible for the final mating, aft fuselage and vertical stabilisers while FN is building complete F-100 engines for Pratt & Whitney — the Belgian companies are also involved in the civil Airbus programme, in particular the A-310 and the Besides the F-16 work -

A-320 models.
On top of this the sector has a significant 5 per cent plus share in the Ariane space programme with Sabca, for arounds designing and develof programme with Sabca, for example, designing and developing the hydraulic servoir 1,458 fairings and the inter reservoir skirts for the Ariane 4 vehicle. The "Big Three" may dominate Beignum's aerospace industry but small companies are playing an increasingly important role notably in the North where the Flemish aero-

North where the Flemish aerospace consortium FLAG, a grouping of more than 100 companies, reflects the recent change.

Formed in 1980, FLAG was largely rectangely assumption

largely responsible for winning a roughly 25 per cent share for its members of the "compensa-tions" tions" guaranteed under last year's F-16 contract. FLAG's general manager Mr Herman Candries, is an enthusiastic disciple of the theory that developments in aerospace can developments in aerospace can be applied in other industries. Perhaps one of the most exciting developments, how-ever, is back in Walloonia where the Squahus civil and military trainer aircraft is expected to progress over the next few

progress over the next few months. Developed by Promavia, a company whose shareholders include several industrialists, investment companies and a bank, the aircraft has received substantial backing from the Government.

Tim Dickson



A new British airliner making its debut at Farnborough is the British Aerospace Advanced Turbo propagate (ATP), which made its maiden flight earlier this month. Its features include a new six-bladed propeller and an advanced electronic flight deck. The ATP is one of the quietest airliners now flying

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The Netherlands

Construction delays hold up deliveries

are based on existing designs instead of completely original

ones, they are supposed to be cheaper to make and lower in

FORKER, the Dutch aerospace group, is levelling off after flying high on a wave of initial orders for its new sircraft, the F-50 and F-100. Missed orders and construction delays have tempered the suphoric atmo-sphere that surrounded a bulg-

sphere that surrounced a unuging order book and record profits last year.

Now Fokker is concentrating
on meeting its delivery timetable, putting finances in order
and possibly expanding abroad
—not to mention obtaining fresh
orders. Hopes are pinned on
several potential sales of the
short- to medium-haul F-50 and
F-100, which would be the first
orders this year for the aircraft
that were unweiled in the unveiled in the

that were unveiled in the autumn of 1983.

One of the possible sales involves GPA, the Irish aircraft lease company involved in an embarrassing incident in June when newspaper headlines in the Dutch press suggested a record F1 4.85m (\$2.035m) order for 100 aircraft. Trading in Fokker shares was temporarily Fokker shares was temporarily suspended on the Amsterdam

GPA, which is backed by Guinness Peat and Aer Lingus, Guinness Feat and Aer Lingus, is has said it is still interested in the F-100, a 100-seat twin jet that is a successor to the F-28 Fellowship. Fokker would clearly welcome the business but is understandably quiet.

Another disappointment was the recent decision by Scandinavian Airline System (SAS) to buy 14 of McDonnell Douglas's MD-87s instead of the F-100 fanjet. Fokker had been thought to have a good chance at the contract, which could have amounted to more than

have amounted to more than Fi 600m. Construction delays in the F-100 have also proven disappointing. Deliveries of the aircraft originally were to have been made in April 1987 to Swissair, the launch customer, but that has been delayed until the autumn as have deliveries to KLM Royal Dutch Airlines. Swissair has demanded F1 500m in compensation for late delivery of the first of its eight F-100s and the question now is whether KLM will do the same.

Stock Exchange, Fokker denied both the F-100 and the F-50, the story and a week later GPA a 50-seat turbo-prop that is a ordered 96 aircraft from Boesuccessor to the F-27 Friending and McDonnell Douglas, the ship, were amounced 21 years ago as Fokker's new aircraft for

A total of 38 orders plus 31 options for the F-100 are in hand and 38 orders plus 10 options for the F-50 but no new contracts have been signed this year. Fokker needs to sell between 150 and 200 of each to recoup its F1 1.2m in development casts and has planned a ment costs and has planned a production schedule of 60 aircraft a year. After years of postponement due to buoyant sales, produc-tion of both the F-27 and F-28

> 786 sales in 63 countries over the past 30 years. Since 1969 some 421 F-28s have been sold in 37 countries. Construction delays in the pair of new aircraft, though, are believed to have played a role in Fokker's request-which

FI 100m in financial aid from

EUROPEAN

are being finally halted this year. Described as one of the most successful aircraft in

history, the F-27 has chalked up

the late 1980s and 1990s. As modernised versions of the F-27 and F-28, they offer operating efficiency, passenger comfort and manoeuvring ease by using new composite materials of great strength and light weight as well as sophisticated cocapit electronics. Because the aircraft are based on existing designs

the original Fi 1.2bn and notes that the government money is in the form of loans and guaran-tees and not grants. But the company would still like to strengthen further its balance sheet and is considering one or two sizeable share issues.

At least part of the proceeds would be used to help finance a new production plant in the US that Fokker would like to build or buy in an attempt to compete better internationally. With sales spread rather evenly around the globe, the zerospace concern is already international oriented. But a deciding factor in possible US production could be the outcome of a huge order from American airlines for as

many as 100 F-100s.

Last year Fokker lost a bid to get a foothold in the North American market through the aerospace company, De Ravilland, through a consortium. The Canadian Government owned in the F1 160m research project (ESA) satellite. Participation in the F1 160m research phase is mandatory if Dutch industry to Boeing, giving the jumbo-jet is mandatory if Dutch industry into the increasingly competitive short- and medium-haul market.

The loss to Bosing did not

the Dutch Government. The Amsterdam-based aircraft maker for taking a 5 per cent stake has received aircast more than FI 800m from the Hague to help cover development costs.

Fokker insists that development costs have not exceeded would carry the risk of a prime contractor while we would field. contractor while we would fulfil the role of a subcontractor," Mr Frans Swarttouw, Fokker's chairman, complained to a

charman, complained to a Dutch newspaper. Fokker is, nevertheless, keenly interested in the propfan technology and has an in-house task force studying possible applications. Meanwhile, Fokker is said to be negotiating with Saudi Arabia for the possible sale of between six and eight F-50s adapted for marine and defence. adapted for marine and defence patrol and surveillance. An order of that size would amount to between \$105m and \$140m for the standard aircraft ver-sion. It would also most likely involve Hollandse Signaalapparaten, the military telecome nications subsidiary of Philips,

In other aerospace develop-ments, the Netherelands agreed in March to participate for FI 7.8m in the research project

Laura Raun

HELICOPTER



The Fokker 100 twin-engined jet airliner will have one of the world's most advanced electronic flight decks, giving the crew instant information on the

INDUSTRIES

NDUSTRIES



The Italian-Brazilian AMX tactical fighter, powered by Rolls-Royce Spey engines, is being built jointly by Aeritalia and Aermacchi of Italy and Embraer

Italy

Political bars to merger

TRIES IS turning out to be an and third biggest Italian zero-eventful year for Italy's zero-space company, Aermacchi, had contracts from home and

The two main companies, Aeritalia and Agusta, are at the centre of a growing political row about whether they should be merged to create a unified Italian business.

The problem is that Aeritalia is controlled by the IRI-Francecanica state holding

neni

Ri-Finmeccanica state holding group, which in turn is influenced by the Christian Democrat Party. The smaller Agusta helicopter maker, which faces other problems as well, is 97 per cent owned by the Efim state holding group, Italy's smallest such state group and close to the tiny Social Democrat Party.

Prof. Romano Prodi, the dynamic chairman of IRL realises that it would make sense to bring the two aerospace companies together. But his patrons in the Christian Democrat Party may not be willing to risk the trade-offs involved in the political haggling which would be required to achieve what in other countries might be seen as intelligent and commonsense industrial rationalisation.

The year made an eventful star, when Agusta was a mem-ber of the European consortium along with Aerospatiale of France and Messerschmidt of West Germany which made its unsuccessful rescue bid for Westland of the UK.

Not only was the Euro-bid beaten by United Technologies and Fiat but Agusta and Fiat rowed in public at home over the issue. Once again, political rivairies infested the Italian aerospace industry, doing dam-age to all concerned.

age to all concerned.

These problems notwithstanding, the industry did manage a healthy 1,660 trade surplus last year. Total industry turnover increased by 15 per cent to 74.500bm.

L4.500tm. Agusta nor Aeritalia are large when compared to swinging companies in France or Eritain. In 1965, for aumpie, Aeritalia's total consultated lumover came to L1.377tm, while Augusta's turnover was L1.125bm. The smaller

1985 sales of L240bn.
Something like 75 per cent
of the orders received by Aeritalia and Agusta are defencerelated, while Aermacchi is
totally defence-oriented.
The boom in exports of recent

years appears to be over and certain projects under way, although heavily promoted, have yet to achieve the orders to justify the investment. Take, for example, the Aeritalia-Aermscchi programme to build Aermacchi programme to build the AMX light fighter and ground attack aircraft. Brazil's Embraer has 30 per cent of the

AMX projects and a production line in Brazil Italy and Brazil both hope the AMX will be suitable not just for their own air forces, but also for those of develop-ing countries. But the only orders won so far are the 270 aircraft ordered by Rome and Brasilia.

One achievement, not in the defence area, is the recentlycompleted civilian turbo-prop commuter aircraft built by commuter aircraft built by Aeritalia and Aerospatiale of France. The ATR 42, or Hummingbird, is designed to relieve long-suffering business fiyers in Italy. Orders have been picking up.

Back in defence, Aeritalia is hoping to translate the experience it gained on the Anglo-German-Italian Tornado by picking up a larger share of the

German-Italian Tornado by picking up a larger share of the planned European Fighter Aircraft (EFA) project.

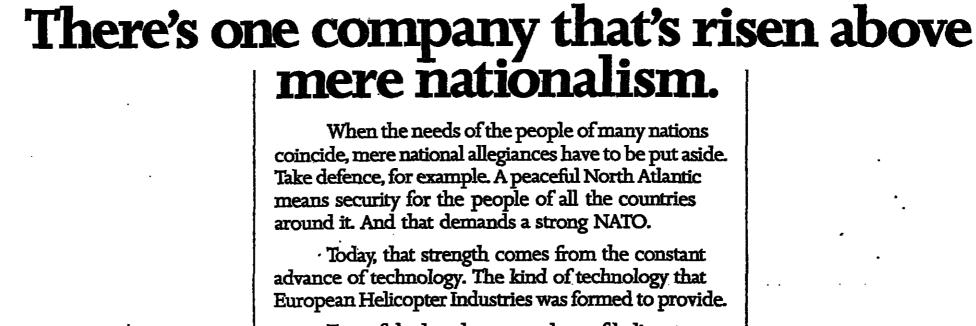
Agusta, meanwhile, is still collaborating with Britain's Westland on the EH-101 naval helicopter. Some £650m has been spent on developing the EH-101. So far there are only 90 orders which are firm.

EH-101. So far there are only 90 orders which are firm.

There are other examples of Italian aerospace companies working with one another, with foreign companies, and at times in rivalry with some of the same companies.

That a restructuring of the industry would make it more affective appears logical. But the main problem it faces remains not technology or finance: it is the fact that its higgest companies are often subject to political whims rather than industrial logic.

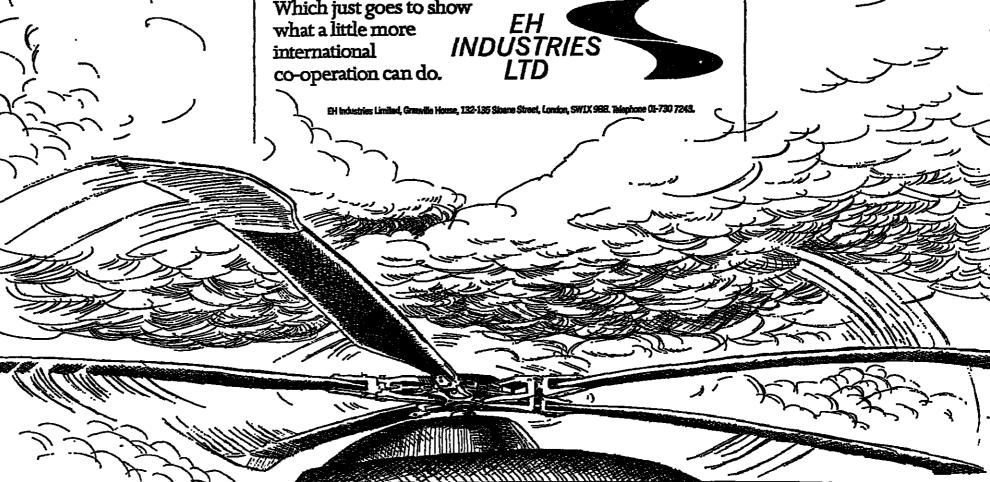
Alan Friedman



Two of the best known makers of helicopters have pooled their experience and resources into one truly international company with the resources and backup to design, develop and build the answer to NATO's naval helicopter needs for the 1990s and beyond. The result, EH101, is so advanced that it will be an extremely versatile military and civil transport, too.

European Helicopter Industries is the result of a highly successful collaborative venture between Agusta of Italy and Westland of Great Britain. It will benefit not only the employees and shareholders of the two parent companies, but also the people of Italy, Britain and the whole of NATO.

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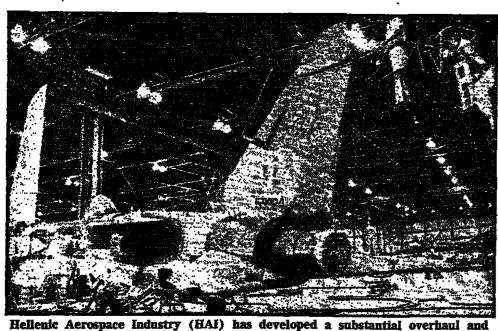
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Hellenic Aerospace Industry (HAI) has developed a substantial overhaul and maintenance capability for military alreraft. Shown here is a Greek Air Force A-7H Corsair fighter undergoing maintenance

Greece

Breakthrough parts deal

THIS HAS BEEN a break- General Dynamics are expected through year for the Hellenic to be completed by mid-autumn. Aerospace Industry (HAI). Following the signing of a FFT 1bn contract in Paris in June, HAI is set to begin manufacture of a range of parts for the Mirage-2000 fighter aircraft a significant expansion which the Greek state aero-Advance space concern has long been airliner. anticipating.

The Mirage-2000 contract is designed to offset part of the cost of a FFr 7.6bn purchase of 40 of the French jets for the Hellenic Air force. It runs to the year 2000, and set HAI participation at one half to one third of Mirage-2000 sales world wide. Under the terms of the contract HAI will make a variety of parts including sections of the aircraft wing, fuselage, and landing, navi-gation and electronic radar

fighter jets, which the Govern-

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to be completed by mid-autumn. whose \$400m plant established So far, HAI's manufacturing in the 1970s with managerial activities have included air-brakes for the Mirage-2000, Airbus doorframes, and, under a kick-off contract signed with British Aerospace last December, valued at \$12m, flap assemblies for the new Advanced Turbe-Prop (ATP)

HAI's repair and maintenance contracts cover a range of client countries both in the West and the Middle East company's success in the latter company's success in the latter region being owed partly, according to HAI, to Greece's close ties with the Arab world. Thus HAI handles Nigerian, Jordanian and Canadian Hercules C-130 transport aircraft, and J-79 engines for the US Air Force in Europe and the Royal Air Force.

gation and electronic radar systems.

HAI hopes to win similar offset work from the purchase of 40 General Dynamics F-16 F-1 and Atar engines. In June HAI also signed a three-year

In addition the company and technological help from Lockheed International repre-sents one of the single largest industrial investments in Greece, saves the state millions of dollars each year in vital foreign exchange by handling repair and maintenance for the Hellenic Air Force, and to a more limited extent the state carrier Olympic Airways.

HAI's role as a foreign ex-change earner and saver counters, in the management's view, the fact that the company is running at a loss. HAI is in any case proud of having trimmed losses from Drachmas 1.3bn in 1981 to Drachmas 15m in 1985.
The company's foreign debt has also been halved in the same period, from \$320m to \$163m, and the ratio of own to borrowed capital improved from

The company, which employs 3.200. has been all-Greek since terminating the contract with Lockheed nearly two years ago, a move designed to "Helenise" HAI as much as to save some \$300m a year in salaries



Offsets policy brings benefits

AUSTRALIA'S aerospace industry lost an excellent chance to prove its design capability when the government decided earlier this year to buy the Swiss PC-9 basic trainer for the Royal Australian Air Force instead of a locally-developed aircraft. The Defence Department has ordered 67 PC-9s from Pilatus at a fixed price of A\$230m (US\$140m) for delivery be-tween 1987 and 1991. The aircraft will gradually replace the current fleet of Macchi jet trainers and New Zealand-built, oiston-engined CT-4s.

The race loser was British-controlled Hawker de Havilland which, together withthe Government Aircraft Factories, had spent at least A\$130m in designing and developing the Wamira A10B trainer to government specifications. It is doubtful if the Wamira will now be pro-duced commercially but Hawker has said it would try to perfect the design.

Hawker and its consortium partners—Government Aircraft Factories and Commonwealth Aircraft Corporation which it has since taken over—was to have exclusive rights to the contract. But frightening cost overtract. But frightening cost over-runs, project delays and production inefficiencies surfaced.
The government decided that
Australia's own industry was
not yet competitive in terms of design and that it still needed to learn from the more sophisticated Western manufacturers.



Australian Airlines, formerly Trans Australia Airlines, is spending more than A\$1bn on new aircraft, including 12 Boeing 737-300s, the first of which (seen above) has now been delivered

it was awarded the contract to build the aircraft under licence from Pilatus, a condition Department and the govern-Pilatus agreed to in order to ment-run airlines are currently

clinch the deal.

The condition comes under the Austrellan government's profitable contracts for foreign offsets policy which requires foreign suppliers of government profitable contracts for foreign suppliers and Australian components are the povernment-owned. contracts worth at least A\$2.5m to pass on part of the contract-related work to Australian industry. The offset work required is at least 30 per cent of the value of the contract. They are required on both civil and de-fence purchases and the big-gest suppliers so far under the gest supplies so in the title policy are the US, Britain, West Germany, Japan and France. The aerospace industry in fact stands to benefit the most a g

As a consolation to Hawker, from the offsets policy, in terms was awarded the contract to of both contract value and technology transfer. The Defence Department and the governon a buying spree for aircraft and equipment, promising monopolies over major monopolies over mon

lines, the government-owned Australian Airlines (previously Trans Australia Airlines) and the privately-run Ansett, have of aircraft.

Although Ansett is a private of Boeing 747s and 767s are also company, it is covered by the offsets policy which specifies ment.

On defence-related purchases, apply to "organisations having the latest and biggest were the lat vernment-bestowed protec-

tive advantage, including air-craft and associated equipment bought by Ansett for use under the two-airline agreement." Under the two-airline agreement, AA and Ansett have

bus Industrie A-320 Skystars with an option to buy mine more, 12 Boeing 737-300s and 15 Fokker F-50 turbo props. TAA, meanwhile, has ordered A\$500m-worth of Boeing 737ntly ordered A\$2.8bn-worth 800s to replace its DC-9 fleet Recent purchases by Qantas of Boeing 747s and 767s are also

worth A\$500m awarded last May to United Technologies of the US. The order was won in the face of strong-competition from France's Aerospatiale which offered its Super Puma helicop-

The first contract was for 14 Sikorsky Black Hawk helicop-ters which eventually will replace the Royal Australian Air Force's Bell Iroquoi UE-1H helicopters. The Air Force plans to acquire up to 100 new

heliconters. nelicopters.

The second contract, worth A\$188m, is for an additional eight Sikorsky Sea Hawks for the Australian Navy, which already has eight of these helicopters. Mr Kim Beasley, the Defence Minister, said the two contracts would generate A\$120m in new work for the Australian serospace industry. Australian aerospace industry. Earlier this year, the Defence Department also awarded a A\$29m order to Italy's Selema Elettronics for two sirfield sur-veillance radars. Selenia had agreed on Australian partici-pation in the design and manu-

parion in the design and manufacture of the equipment, Mr Benzley said.

Apart from passing on part of the radar-related work to local companies, Selenia had also asked its Australian partner, Ansett Technologies, to manufacture and programme two automated test stations for the maintenance of the radars.

Emilia Tagaza

000

Brazil

Latest thinking in unorthodox turboprop

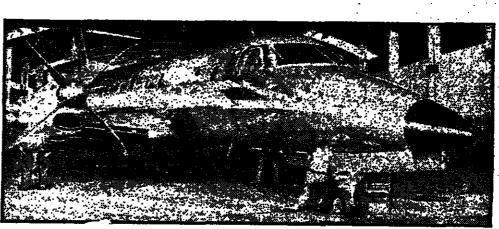
THE Farnborough Air Show is in for some drama as Embraer, Brazil's aircraft manufacturer, shows its new-generation, 19-The yet-unnam aircraft, designated EMB-123, which has two backward-facing turbo-props attached to the tail section, is an advanced aircraft that makes full use of some of the latest thinking in civil aircraft design. Intended for commuter traffic

and carrying a price tag of under \$3.5m, the aircraft is planned for service in 1990 as a replacement for the company's successful Bandeirante, the twin turbo-prop aircraft of which 460 have been sold worldwide since 1972, The EMB-123 features un-

orthodox aerodynamic concepts for this category of aircraft, Embraer says, and makes extensive use of composite materials struction. It will cost an estimated \$292m from development, prototype construction, testing, and certification to tooling for series production.

The EMB-123 has a canard in the front fuselage section, a super critical wing, and pusher super critical wing, and pusher engines installed in pods near its T-tail. The engine location is designed to give passengers a quieter ride and appeal to the private executive jet market. Argentina, through FMA-Fabrica Militar de Aviones, is to finance one-third of the programme as well as manufacture gramme as well as manufacture the wings and horizontal tail

president



A Brasilia airliner nears completion at the Embraer factory

Ozilio Carlos da Silva, said the Dusseldorf to three UK cities. craft was developed with Aer-joint undertaking made sense The Brasilia is expected to be italia and Aermacchi for the Argentina is Latin America's second-largest market and plans to renew its fleet of aircraft in the near future. The name of the game is to find partners for the development of a new air-craft who can provide a market and firm orders," Sr Silva says.

Embraer is fresh from going it alone in the launch of its popular Brasilia, a 30-seat pressurised turboprop for the regional airline market. It has already been in commercial service for over a year with two regional US airlines and with West Germany's DLT-Deutsche Luftverkehrsgesellschaft flying Sr international flights

a contender for more services Europe with the recent anges in air traffic regulations which allow regional airlines to expand their routes to cross-border destinations. Embraer has 65 firm orders for the Brasilia and 99 on

option, including two from Norway's Norsk Flyjeneste As. Two UK companies currently have the aircraft under consideration

On the military side, a new company, AMX International, headquartered in London and capitalised by Embraer and the two Italian partners on the AMX project, is to market the AMX tactical fighter. This air-

Italian and Brazilian air forces. At a selling price of \$10-11m, the subsonic fighter is expected to find a niche in both countries and the developed military forces of developing It has been years since a

company manufactured sub-sonic fighters," Sr Silva says, "The last one was successful since such aircraft provide close air support to attacks." Series production is to begin next year in both Italy and Brazil with an exchange of parts for an initial

270 aircraft.
Embraer's Tucano, the military trainer, with 130 under order in conjunction with Short

Bros of Belfast to equip Britain's Royal Air Force, is making inroads in Latin Ameri can markets as well. Venezuela has received four out of 30 ordered as part of a bi-national countertrade arrangement.

In late July, Peru signed an order for 20 Tucanos with Brazilian Government financing. The trainer costs \$1.25m to \$1.45m depending on the equipment specified.

Because of initial industrial snags in production of the Brazilia, Embraer may find it difficult to reach this year's export sales target of \$287m, double last year's performance. But thanks to improved international sales and strong demand domestically for small private aircraft, total sales are expected to reach \$350m, resulting in a projected return to profitability.

Last year, the reported an operating loss Cr 200bn (about \$19m at a year-end exchange rate) on sales of Cr 1.5 trillion (million million), nearly \$143m. This was due to heavy investment in R and D and facilities totalling \$119m and reduced demand both at home and

With production lines installed for the Tucano and the Brasilia and facilities ready for the AMX parts production, the company describes last year as one of positioning and consolidation before broadening sales efforts abroad.

Ann Charters

Israel

US pressure to cancel combat aircraft

The cause of the uncertainty mounting pressure from the US Government for Israel to cancel its most ambitious pro-ject yet—the sophiticated Lavi est aircraft—and replace it

be built for the Israeli air force be built for the Israeli air force by the end of the century, at a unit cost of anywhere between US\$ 14.5m and US\$ 22m. It will serve as a multi-role fighter and ground-attack war-plane. However, as executives from the state-owned TAL, Israel Aircraft Industries, and Defence Ministry officials con-Defence Ministry officials con-stantly stress: much more than the fate of a single aircraft is

For Israel, the US\$ 2.5bn (at current prices) Lavi project has become a major source of employment, the means to stem a brain drain abroad and, above all, a symbol of the country's determination to achieve as high a degree of self-reliance as possible in the field of arma-

A single-engined aircraft similar to the General Dynamics F-16 Israel aircady has in service, the Lavi is due to make its maiden flight at the end of next month or in early October. Once airborne, Israeli officials are hoping that the contro-versial project will be much

Much will depend on the results of two studies now anderway in the US, its chief inancier, on the aircraft's current costings and on possible alternatives should it be can-celled. These should be com-pleted before the end of 1985, before the crucial decision has to be taken to move into the

Led by Mr Yitzhak Rabin. Israeli officials insist that the country will not abandon the Lavi, describing is as the most

MORE THAN at any previous moment in its up-and-down history of 30 years, the fate of the Israeli aerospace industry today hangs in the balance.

With a cheaper, American-made committed, much of it US military aid money. Cancellation costs would add another be built for the Israeli air force costs would a US\$ 250m or so.

Cancellation would, inevitably, have a knock-on effect and, have a anoca-on enect throughout the Israeli economy, much of which is nowadays orientated to the needs of the defence industry. Tamam, the dezence incuscry. Tamam, the precision instruments division of IAI, would, for example, have to bring back in house much of the civilian work it has subcontracted to outsiders if contracted to outsiders if contracted to outsiders in contracted to outsiders in the subcontracted to outside the subcontracted the subcontrac contracted to outsiders if con-tracts on the Lavi suddenly dried up.

Up to 3,000 of IAPs 22,000
employees are directly em-ployed on the project, to which should be added another thousand or so at subcontrac-tors in Israel and the US

although it is only at the development stage, the UE aero-space industry already has a sub-stantial stake in the aircraft. Over a hundred pre-production contracts have been left to US companies. Among them are

Grumman, makers of the Lavi's composite-material wings and tail section, Pratt and Whitney and Lear Siegler. In the production phase, IAI forecasts that IIS industry will receive heart US industry will receive about US\$800m from the project.
These considerations notwithstanding, the Pentagon has be-

come the most determined opponent of the aircraft, arguing that it is not cost-effective, and will strain the increasingly stretched US military assistance programme for Israel.

Foreign military sales (FMS) Foreign military sales (FMS) grant aid to Israel has reached

a record annual figure of US\$1.8bn. But US officials say this peak will be frozen for the thoroughly examined project in the history of the country. of overall budget considerations. Equally importantly, about

demands on those funds from ing the development costs, other departments of the Israeli lowering the political risks of armed forces is increasing cancellation and creating a markedly. Senior officers within potential export product.

The Lavi is a tailor-

avionics and weapons systems developed for the Lavi. The replacement aircraft would probably be powered by the new Pratt and Whitney 1120 engine

Pratt and Whitney 1120 engine intended for the Lavi.

Israel originally intended at first to build part, then all, of the 1120 at the Government-owned Bet Shemesh engines plant, in which Pratt and Whitney has a 40 page ages building. ney has a 40 per cent holding. But the aero-engine company has been in increasingly diffi-cult financial straits.

Losses in its financial year to March 1986 came to over US\$20m, on sales of only US\$18m, and have subsequently continued to mount up at a rate of over \$1m a month, Negotiations are thus under and five potential Israeli part-ners, all private concerns, for the purchase of the state's

Heading the list of suitors is Koor Industries, the Labour Federation-owned conslomerate which already has a substantial interest in the defence business. One of its subsidiaries, Tadiran, makes an RPV (remotely piloted vehicle) reported to have had considerable export

For its part, the IAI and the Israeli Government are desper-istali Government are desper-ately seeking a US partner to come in on the project on an equal footing. This would have the triple advantages of spread-

teh Israeli high command have made their objections known in public to the aircraft, regarded as a threat to their own reequipment programmes.

As a substitute, the US is proposing that Israel go for a proposing that Israel go for a lies in the likely hattle grounds of the Middle East during the 1990s. Its strength have grounded incorporate the savionics and weapons systems.

It could possibly be recast in a cheaper, export version for sale to other developing countries — provided the US Government agrees — but, so far, none of the major aerospace manufacturers are reported to have shown more than passing interest.

Beginning in the early 1960s by assembling French-designed trainer aircraft. IAI has made It could possibly be recast in

trainer aircraft, IAI has made trainer aircratt, IAI has made tremendous strides over the years in developing its own design and manufacturing capabilities. It has also shown considerable ingenuity in modifying ariesting aircraft.

considerable ingenuity in modi-itying existing aircraft, a feature which has become something of a stock-in-trade. In profit since its first year, in its last financial year to March 1986, the state company reported sales of just under US\$1bn, nearly two thirds in the form of exports. Aircraft manufacturing, however, has

the form of exports. Aircraft manufacturing, however, has gradually given way to military electronics and missiles, now the company's mainstay. Within the aircraft division, the place of civilian aircraft has also diminished over the past few years. Annual sales have averaged only US\$70m, and their survival now depends heavily on the Astra, a US\$5.5m executive jet competing in world markets with the citation III and British Aerospace's 125 jet.

Andrew Whitley



The only 50 passenger aircraft

that can handle the Docklands.

Singapore

Big increase in sub-contract work

small components to overseas

erospace manufacturers.
The skills of the Singapore workforce and the encourage-ment of the Singapore Government led overseas aerospace companies some time ago to companies some time ago to sub-contract component and equipment manufacture and assembly to companies in the republic. Today this business provides substantial employent, and makes a significant contribution to the country's

economy.

Primarily involved in this business is Singapore Aircraft Industries (SAI), formed early in 1982 as a government-owned industrial group under control of the Ministry of Defence's Sheng-Li Holding Company. It has five wholly-owned and two jointly-owned subsidiaries, and an overall workforce of some

17

ALTHOUGH IT lacks the heavy industrial infrastructure necessary for the manufacture of complete aircraft, Singapore (SAM), Singapore Aero-Combas substantially increased its aerospace activities in recent years.

It has done so largely by providing aircraft and engine overhaul, maintenance and refurbishment facilities; and by supplying electronics and other small components to overseas

Engineering (SEE), Singapore Aero-Combanufacturing (SAM), Singapore Aero-Engine ponents Overhaul (SACO), and Singapore Aero-Engine Overhaul (SAEOL), co-owned with Singapore Airlines; and with Aerospatiale of France.

Collectively, the SAI group Collectively, the SAI group has a combined experience of more than 20 years in the aviation industries. The group offers a range of products and services that spans higher-echelon maintenance, and the repair and refurbishment of aircraft such as the C-130 Hercules, A-4 Skyhawk, Hunter jets, Strikemasters, and US Bell

and French Aerospatiale heli-copters. It also offers overhaul and servicing for aircraft-related components airborne radio, navigational and instrument systems, telecommunications, defence, electronic and weapons systems; test-equipment calibra-tion; and the manufacture of aircraft parts and assemblies. Singapore's growing interest in aerospace is indicated by the fact that, last January, the third Singapore biennial aerospace exhibition was the biggest yet.

western world's major sero-space manufacturers attended.
One reason for this success apart from Singapore's growing-direct involvement in aerospace engineering, is that the Far East, and the south-east Asian and Pacific best as a whole, is

One reason for this success apart from Singapore's growing direct involvement in aerospace engineering, is that the Far and East, and the south-east Asian and Pacific basin as a whole, is the world's fastest growing region in civil aviation. It is described by Mr Cheong Choong Kong, managing director of Singapore Airlines, as the future dynamo of the international civil aviation industry."

If thas not only become the national civil aviation industry."

If thas not only become the catalyst for growth beyond its own boundaries." he says. "Over the past 20 years, Asia-Pacific has been the world's fastest-growing region."

"It's newly-industrialised countries, spearheaded by Japan, have emerged as major trading forward All of the

Japan, have emerged as major trading forces. All of the region's economies are vigorous, export-orientated, and dedicated to expansion. They provide an attractive environment for foreign investment as well as trade in general. "The new suns rising in the

region have not escaped the The wholly-owned companies exhibition was the biggest yet. attention of the world's trading port aircraft. And the Japanese glants. In 1983, the US-Pacific acrospace industry is a fortenance Company (SAMCO), from all over the world exhibition trade was 24 per cent greater industry is a formal over the world exhibition trade was 24 per cent greater industry is a formal over the world exhibition trade was 24 per cent greater industry is a formal over the world exhibition trade was 24 per cent greater industry is a formal over the world exhibition trade was 24 per cent greater industry is a formal over the world exhibition trade was 24 per cent greater industry is a formal over the world exhibition trade was 24 per cent greater industry is a formal over the world exhibition trade was 24 per cent greater industry is a formal over the world exhibition trade was 24 per cent greater industry is a formal over the world exhibition trade was 24 per cent greater industry is a formal over the world exhibition trade was 24 per cent greater industry is a formal over the world exhibition trade was 24 per cent greater industry is a formal over the world exhibition trade was 24 per cent greater industry is a formal over the world exhibition trade was 24 per cent greater industry in the largest acrosphenes in the contract of the world in the worl

This situation applies to aerospace manufacturing as well as civil air transport, Many major western aerospace companies now retain offices in Singapore,

the entire Asia-Pacific arena, rising research, development with the spin-off effect of and production costs, at least promoting Singapore as the focus of aerospace development with Japan and Communist in the region.

The country faces considerable competition, however.
Neighbouring Indonesia is already rising rapidly as an indigenous aircraft manufacture. turer, especially of light transport aircraft. And the Japanese aerospace industry is a formidable force in world markets,

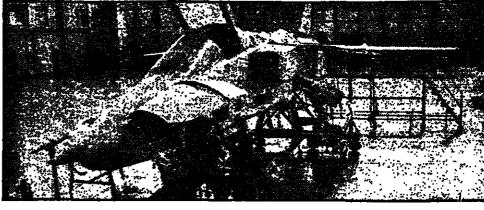
space exhibition in the Far East and South-East Asia although the Indonesian air show is now a close rival. Most of the western world's major aero civil air transport, Many major airliner. Malaysia, too, is new western aerospace programmes, such as the projected Boeing 7J7 prop-fan 150-seat airliner. Malaysia, too, is increasingly interested in promoting its aerospace industry as a potential major contribution to the economy.

far eastern aerospace is the growing power of the People's Republic of China, which, over the past two to three years, has been arranging co-production and other deals with western aerospace manufacturers with a view to modernising its own

industry. Singapore recognises that, with its own limited population and financial resources, it is never likely to become involved in large-scale manufacture of indigenously-designed aircraft, expecially in the light of today's especially in the light of today's

China_ But, as a major supplier of equipment, components and sub-assemblies, and as a major overhaul, maintenance and re-furbishing centre for both civil and military aircraft, it is already a major force in the Asia-Pacific region.

Michael Donne



Final assembly of a Jaguar jet strike-trainer, built under licence by Hindusthan Aeronautics of Bangalore

India

Merger to bring savings

for major structural changes in the next year or two following the government's decision to merge Air India, the international carrier, with the domes-tic Indian Airlines. The complicated work involved in the amalgamation will probably take more than a year but, after it is completed, economies worth about Rupees 1bn are ex-

Both companies are doing well, even at a time when most of the world's airlines are going through a difficult phase. India made a record profit of about Rupees 650m in 1985-86. partly from its lucrative Gulf routes, and Indian Airlines made a profit of Rupees 587m.

The reason for the merger decision is the need to reduce overheads and avoid duplicadeal of complementarity be-IPTN has an arrangement tween them, especially now that with General Electric to set up Air India has recently added the Airbus A-310 to its fleet.

Indian Airlines already uses the Airbus A-300 on its main trunk routes in the country and on some of its services to neighbouring countries. Earlier this will be involved. This sh year, it signed a \$1bn contract fill a long-felt business nee with Airbus Industrie for 19 chartering small aircraft.

Airbus-A320s (with an option Militarily, the government of the strength exchange purely will be involved. This sh will be involved. This sh year, it signed a \$1bn contract will be involved. This sh will be involved. This sh will be involved. This sh year, it signed a \$1bn contract will be involved. This sh will be involved. This sh year, it signed a \$1bn contract will be involved. This sh will be involved. This sh year, it signed a \$1bn contract fill be involved. This sh will be involved. This sh year, it signed a \$1bn contract fill be involved. This sh year, it signed a \$1bn contract fill be involved. This sh year, it signed a \$1bn contract fill be involved. This sh year, it signed a \$1bn contract fill be involved. This sh year, it signed a \$1bn contract fill be involved. This sh year, it signed a \$1bn contract fill be involved. This sh year, it signed a \$1bn contract fill be involved. This sh year, it signed a \$1bn contract fill be involved. This sh year, it signed a \$1bn contract fill be involved. This sh year, it signed a \$1bn contract fill be involved. The signed a \$1bn contract fil for 12 more), and this will give both airlines aircraft made by the same company.

regional routes, is also expanding fast with its fleet of Dorniers, Fokkers and the Indian-made Avro. It is now examining offers from many countries, including France, Britain and Sweden, for small 40-seat aircraft for further expansion.

Mr Harsh Vardhan, Vavudoot's chief executive, expects to wipe off the airline's accumulated losses of about Rupees 20m within the next two years. To the 52 destinations on 34 routes. Vayudoot plans to add another 44 this year, to increase its operations substantially.

Two major developments will add to India's growing aviation industry. The government has established a helicopter corpora-tion based on Westland W-30s and Aerospatiale Dauphins. These will help the Oil and Natural Gas Commission's offshore operations as well as provide helicopters for use inside the country.

The government has also decided to permit the use of air taxis in India These will be on small executive aircraft already available and so no foreign exchange purchases will be involved. This should fill a long-felt business need for

Militarily, the government-owned Hindusthan Aeronautics is gearing itself to make the latest of the MiG series— Staff and other economies agreement was reached in July, should be possible as a result. The aircraft is the MiG-29, code-

So far, Hindusthan Aeronau tics has made only the improved version of the MiG-21 in its three plants that form its MiG complex. Now that the Indian Air Force has decided to make the MiG series its basic aircraft for a decade, newer versions are to be added. The air force is already flying the MiG-23, MiG-25 and MiG-27, and will soon acquire the MiG-29.

These are already being maintained and serviced in the country and their manufacture under licence from the Soviet Union has been agreed. Actual plans for production of particular aircraft will now be worked out according to Russia's willingness to transfer technology for the latest

Hindusthan Aeronautics is already assembling the Jaguar under a deal with British Aerospace but plans to manufacture the Mirage 2000 (40 are to be bought outright and a deal for a few more is expected to be signed soon) have been abandoned.

Hindusthan Aeronautics says that its plans to develop its own "light combat aircraft," which will be used in the 1990s, are on schedule. The airframe has on schedule. In airraine has already been designed but until India can make its own gas-turbine engine (coded GTX), the aircraft will be powered by an imported engine.

In the running for this con-tract are General Electric's F-404 and the Rolls-Royce RB-199.

Indonesia

Commercial battle over military contract

HIGH ambition in the Indonesia newest aircraft, stand between a typical product of the Habibie aerospace industry has its roots the piles of documents which approach. in a decision by President Subarto in the early 1970s to launch the country directly from poverty into technological orbit. Now, after a 15-year factory in Indonesia, Indonesia record of achievement on a this year held its first interscale which few might have national air show—again with thought possible, the growing more success than most aerospace industry is tightly woven around the unusual personality of Dr B. J. Habibie, Indonesia's Minister for Research and Technology.

Dr Habibie is so obsessed craft and as a possible locati-with building up this high-technology end of the Indo-nesian economy that he lives broke out between the America and breathes aeroplanes. The F-16 manufacturer General show was a reported offer by Indonesia as the Tetuko and in desk in his Jakarta office is Dynamics and the maker of Panavia—the joint venture becrowded with models of advanced aircraft. Design charts Dassault Breguet, was largely and Italy—to manufacture the MBB of West Germany for the of the CN-235, Mr Habibie's as a result of the air show and Tornado jet fighter under production of the BO-105 heli-

the surrounds himself with during his long working day.

Ten years after the establishment of the Nurtanio aircraft only after the US manufacturer observers believed likely. The main result has been a heightening of international interest in Indonesia as a

market for high-technology air-craft and as a possible location The commercial battle which broke out between the American

was forced to fight—largely on the proportion of local manu-facture—to stay in the race. Dr Habibie's first dream 1s aircraft technology for Indonesia; his second centres

on local component manufacture at the most sophisticated level. He is aiming to reach the same stage of aerospace technology as European, American and Japanese industries in 10 years. Another spin-off of the air

is still in its early stages. The most recent development in the industry was an agreement between Boeing and the the 412 helicopter.
Indonesian Nusantara Aircraft IPTN has an a Manufacturing Co., or IPTN, the new name for the Nurtanio Company, signed during the air show. This involves Boeing taking Indonesian hardware in return for its aircraft.

Indonesia already has agree-ments with five international groups for the local production of a range of aircraft. The latest involves co-production with Casa of Spain of the jointly-designed Cl. 235, known in Indonesia as the Tetuko and in

licence in Indonesia. But this copter; with Aerospatiale France for the Superpuma AF tion of operations, particularly 332 helicopter, and with Bell of in maintenance and engineering the US for the production of workshops. There is also a great

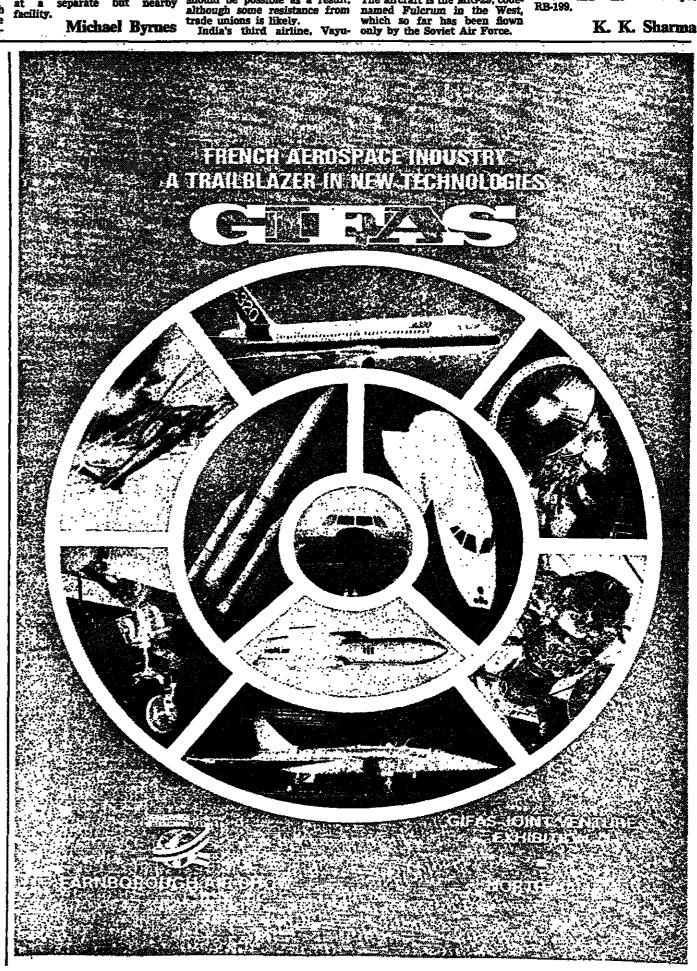
> and operate the universal en-gine maintenance centre in Bandung, the west Java site of IPTN's main factory. The centre is expected to be in full operation by 1988. IPTN also has manufacturing arrangements with the domestic Indonesian airline, Merpati Nusantara Airlines.

IPTN's Bandung aircraft works are already connected with largely unpublicised re-search into missile production at a separate but nearby



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Links with the West increasing

THE People's Republic of China will be sending a big mission to the Farnborough Air Show. While the Chinese will have

an exhibition in the big covered hall on top of the hill over-looking the runway, which is expected to indicate some of the capabilities of the Chinese aerospace industry, the mission's primary aim will be to discuss with a wide range of Western aerospace industry representatives how they can work to-gether in the years shead, to their mutual benefit.

The Chinese team will include representatives of China Promotion, China Aviation Sup-Plies Corporation, China National Electronics Import-Export Corporation, China National Aero Technology Import-Export Corporation (Catic), China North Industries Corporation and China Precision Machinery Import-Export Corporation.

Such Chinese missions have been seen increasingly at Western air shows in recent years, reflecting the expanding interest in what the West has to offer technologically in aerospace. The missions also show a readiness to take advantage of the eagerness of Western companies themselves to do business in the

vast and growing Chinese aero-space market. The State aircraft factories The State aircraft factories are located principally at Shenyang, Xian, Shaanxi, Harbin, of such a size on its own.

Shanghai, Belting, Nanchang, However, quantity production of the Y-10 apparently is not intended, at least so far, and the Chinese air transport industrial.

industry depended on the manufacture under licence of designs originating in the Soviet Union — before the political rift of 1960 and then the Cultural tion, China Aviation Expo '84, Revolution, which also affected the aerospace industry with its manufacturers of all types of anti-technology bias.

This dependence on old Soviet designs continues, and is what they had to offer. still to be seen across the spectrum of Chinese aerospace activities, including fighters (such as the Shenyang J-8 air-superiority aircraft), bombers (such as the Xian H-6 based on the Tupolev Tu-16 or Badger), and the Hanzhong Y-8 four turbo-prop transport derived from the original Antonov Ap-12

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More recently, the efforts to undertake development from designs other than a Soviet origin have yielded the Shang-hai Y-10 four-jet transport.

Although this has similarities



The Chinese Shenyang F-6 fighter, based on the Soviet Union's Mig 19 design (below) and the Boeing twinengined 767-200 ER (Extended Range) airliner for the Civil Aviation Administration of China.



The McDonnell Douglas deal, involving 26 MD-80s with an

enter service in 1987. The agreement with McDon-

nell Douglas involves also the

establishment of a joint task

force to carry out engineering and market feasibility studies.

aimed at the co-operative development of other new air-

liners for the future, while also

providing for continuing efforts to expand China's aviation exports trade.

to the Boeing 707, development the McDonnell Douglas MD-80 twin-engined short-to-medium 707s were sold to China, and the twin-engined short-to-medium range jet airliners. Earlier procurement included Boeing 747
curement in aircraft was undertaken to demonstrate the Chinese indus-

and Chengdu.

For the early part of the post the Chinese air transport indus-Second World War period, the try continues to depend on estern manufacturers for most of its modern equipment. This was apparent at the

major Chinese aerospace exhibiequipment were invited to show

Not only as a direct result of that exhibition, but also because of some long, hard and patient salesmanship by Western aerospace companies, Chinese purchases of foreignbuilt civil aircraft have expanded considerably over the past 18 months.

Major deals have included procurement of British Aero-space Type 146 four-engined regional jet airliners, European indigenous manufacture, of a wide-bodied A-310 Airbuses, the smaller Short Brothers' Type 360 twin-engined turbo-propeller 36-seat regional aircraft, and seeming, leading eventually to indigenous manufacture, of a forthcoming Farnborough show, large Western commercial transsignificant further sales will parts of other Western aircraft are already made under licence Michael Donne

in China including some parts for the BAe-146 regional jet

The eventual number of MD-80 type aircraft the Chinese will build is not known, but it is recognised that with that country's growing civil air transport industry, its demands through the rest of this century for transport aircraft will run into many hundreds of all types, ranging from small turbo-prop feeder-liners through to big. longer-range types.

The Chinese industry is

big, longer-range types.
The Chinese industry is already showing a strong interest in the emerging propfan form of propulsion. The Shanghai Aviation Industrial Corporation has already linked with McDonnell Douglas in the latter's plan to develop the MD-91X prop-fan airliner for the early 1990s.

Also, more recently at the Hanover Air Show, it was announced that the Catic organisation had signed an agreement with the West German Messer-schmitt-Bolkow-Blohm to cooperate on the development of a 75-passenger commuter-sized prop-fan airliner, the MPC-75. The aim is to undertake a

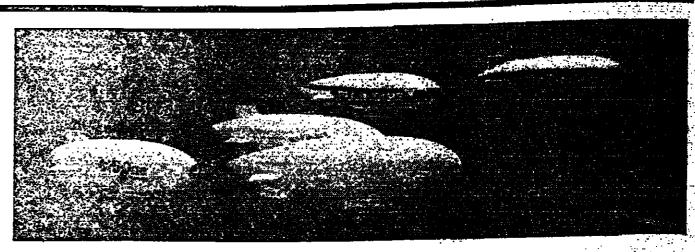
feasibility study by mid-1987, and the partners will then decide whether the market will support full-scale development. The view is that it most likely will, for it is estimated that the

world market for aircraft in the

70 to 90-seat passenger size will amount to more than 900 option on another 14, is especially significant for it involves aircraft by the early 21st cen-tury, with China itself likely to 25 of those aircraft being assembled in Shanghai, at the need about 250 such aircraft. This interest in the prop-fan factory of the Shanghai Avia-tion Industrial Corporation, with parts being built in both Long Beach, California, and in indicates that Chinese aerospace planners are alert to the most recent developments of the Western aerospace industries, Shanghai. The first Shanghai-assembled aircraft is due to and are anxious to get some

part in them. Other manufacturers besides McDonnell Douglas and British Aerospace are anxious to get footholds in the Chinese market, both through direct sales to Chinese airlines (especially as more of these are emerging under the reorganisation of air transport in that country) and through the manufacture of parts and equipment.

The McDonnell Douglas Thus, the sales teams are and due to make its maiden Chinese deal was the first regularly visiting China in flight late next spring example of a large-scale co- growing quantities, and it is This craft will be the first in partnership operation in hoped that as a result of the assembly, leading eventually to indigenous manufacture, of a forthcoming Farnborough show,



Impressive line-up of airships built by Airship Industries of the UK shows how production of this type of craft is now expanding, both in the UK and the US, where the company has bases

Airships

Expansion in uses and technology

THERE ARE many companies, cal in various parts of the world, ALL involved in the manufacture of ALL balloons (either manned or un-manned), and other types of lighter-than-air craft for a wide variety of uses.

However, the two companies most actively engaged in the development of airships—that is, manned, powered and steer-able craft capable of carrying passengers and cargo payloads—are Airship Industries of the —are Airsinp industries of the UK and Goodyear Aerospace, a wholly-owned subsidiary of the Goodyear Tire and Rubber Company of the US.

tors,

Goodyear has been involved with airships (which it calls Blimps) for many years, and has built over 300, more than any other company in the world, of which over 250 have been for the US Army and Navy, and the most communication. the rest commercial craft.

Goodyear currently operates several non-rigid airships for public relations and sales promotion activities, of which the four most recent are the America (N3A), Columbia and Europea (N2A) and Enterprise

Goodyear of Akron, Ohio, is now constructing a major new advanced technology airship, called the GZ-22, a nine-passenger craft designed to fly at a speed of about 65 knots, and due to make its maiden

and an endurance of about 24 hours. power, with two Allison 420 ho turbo-propeller engines. It will at further sales will also include a new electronic the year ahead.

Michael Donne

also include a new electronic control system which replaces the usual mechanical control wires with lightweight electri-

Airship Industries, known as AIL, set up in the UK in 1978, is now owned 49 per cent by Bond Corporation of Australia, with Westinghouse Electric of the US holding 3 per cent and Ansett Transport Industries of Australia a small percentage,

assembly.

The company has sold its Skyship 600 craft to Resorts International of Atlantic City,

this year, will be used exten-

and the rest in the hands of institutional and private inves-Power in the Skyship 600 is provided by two turbo-charged Porsche engines, driving five-bladed variable pitch propellers in ducts on either side of the The Westinghouse interest is part of an overall \$8m deal agreed earlier this year whereby a "joint venture" passenger gondola, slung beneath the craft's hull. company was set up in the US by AIL and Westinghouse to

The ducts surrounding the propellers serve to reduce propursue military and business. propellers serve to reduce pro-peller noise levels both in the gondola and on the ground, while also improving safety for ground crews and boarding pas-sengers, and increasing overall propeller efficiency. ATL with bases at Cardington, A comparable joint venture company has been set up with Ansett Transport Industries, called Asian Pacific Airships, to market airships in the Pacific Basin region. All's philosophy is to create further such com-ATL, with bases at Cardington, Bedfordshire, and Weeksville, North Carolina, now has the largest fleet of airships flying, with a total of nine Skyships operational in the US, Europe, Australia and Japan, another (a Series 600) nearing completion, and two more awaiting

panies where it can so as to exploit the overall potential of airships as widely as possible. AIL itself has to date built two separate types of craft—the Skyship 500 and the larger Skyship 600. The Skyship 500, which first flew in 1981, is a four to six-passenger craft, with a maximum speed of about 55 knots and an endurance (at a speed of 30 knots) of about 19 hours. The larger Skyship 600, which first flew in 1984, is a 12. to 14-passenger craft, with a maximum speed of 60 knots

AIL says its Skyhlp series has been designed to make extensive use of advanced high-strength. lightweight materials such as Keviar, glass-

reinforced plastic and honeycomb sandwich composites. The envelope material, a high-strength, low-permeability polyester, was developed specifically for this range of airships.

The use of non-combustible helium as the lifting gas has eliminated the dangers associated with the earlier use of a 100-ton airship which it claims could stay on station for three or four days station for three or four days are station.

at a stretch, and have operat-ing costs of only about one-third of a conventional aircraft. AIL is concentrating a signi-

ficant volume of its resources on its bid for the big \$4bn-plus US Navy contract for an oceanic fleet surveillance airship, under the Navy Airship Programme, or NSP, for which both Good-year and also Boeing of the US are bidding.

This programme calls for a large "forever-on-station" craft for overhead surveillance of the fleet, with the airships carrydetecting incoming cruise mis-

The studies by AIL and Westinghouse in their joint bid for this contract will be submitted to the US Navy soon, in response to a "Request For Pronsals." The US Navy will then take some time to evaluate the proposals from all parties, and a decision may come either later this year or early in 1987.

New Jersey, and to Swan Tele-vision of Perth, Western Aus-tralia—the latter craft, which made its maiden flight in May, Whoever wins that contract will be assured of a major airships production programme lasting many years, quite apart from the substantial boost it sively as a camera platform during the America's Cup yacht races in 1987. AIL has sold a Skyship 500 to Japan Airship Services, a subsidiary of Japan Air Lines. The other craft it uses itself. will give to the ultimate de-velopment of commercial air-

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